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Vol. 967 Number 2

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

February 14, 1978

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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

February 14, 1978 Volume 967 Number 2

CONTENTS

	Page
Patent and Trademark Notices	
Reissue Applications Filed	967 OG 6
Patent Notices	
Certificates of Correction for the Week of February 14, 1978	967 OG 7
Adverse Decisions in Interferences	967 OG 7
Disclaimers	967 OG 7
Condition of Patent Applications	967 OG 9
Reissue Patents Granted (29,536)	375
Plant Patents Granted (4,213)	377
Patents Granted	
General and Mechanical (4,073,014)	379
Chemical (4,073,614)	579
Electrical (4,073,064)	703
Design Patents Granted (247,201)	805
Index of Patentees	PI 1
Indices of Reissues, Plants and Designs	PI 48
Classification of	
Patents (Including Reissues)	PI 51
Designs and Plants	PI 54
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 55
Designs and Plants	PI 56
Change of Address Form and Subscription Order Form	Back Page

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PATENT AND TRADEMARK OFFICE NOTICES

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,212,062, Re. S.N. 846,356, Filed Oct. 28, 1977, Cl. 235/61.7 B, CHECK AUTHORIZATION SYSTEM, Robert N. Goldman, et al., Owner of Record: *Telecredit, Inc., Wilmington, Del.,* Attorney or Agent: Edward J. Brenner, et al., Ex. Gp.: 235

3,212,062, Re. S.N. 846,357, Filed Oct. 28, 1977, Cl. 235/61.7 B, CHECK AUTHORIZATION SYSTEM, Robert N. Goldman, Owner of Record: *Telecredit, Inc., Wilmington, Del.,* Attorney or Agent: Edward J. Brenner, et al., Ex. Gp.: 235

3,459,961, Re. S.N. 856,547, Filed Dec. 1, 1977, Cl. 307/116, MOVEMENT RESPONSIVE LIGHT CONTROL MEANS, Richard J. Ravas, Owner of Record: *Westinghouse Electric Corporation, Pittsburgh, Pa.,* Attorney or Agent: C. L. McHale, et al., Ex. Gp.: 217

3,572,117, Re. S.N. 852,581, Filed Nov. 17, 1977, Cl. 73/194 B, BLUFF BODY FLOWMETER, Allan E. Rodely, Owner of Record: *Neptune Eastech, Inc., Atlanta, Ga.,* Attorney or Agent: Frederick W. Padden, Ex. Gp.: 244

3,645,706, Re. S.N. 859,243, Filed Dec. 9, 1977, Cl. 51/295, RESINOLD GRINDING WHEELS CONTAINING NICKEL-COATED CUBIC BORON NITRIDE PARTICLES, Harold Paul Bovenkerk, et al., Owner of Record: *General Electric Co., New York, N.Y.,* Attorney or Agent: Donald J. Voss, et al., Ex. Gp.: 147

3,825,083, Re. S.N. 854,467, Filed Nov. 23, 1977, Cl. 175/394, DRILL BIT AND STABILIZER COMBINATION, Frank O'Dell Flarity, et al., Owner of Record: *Christensen Diamond Products Company, Salt Lake City, Utah,* Attorney or Agent: Bernard Kriegel, et al., Ex. Gp.: 354

3,887,964, Re. S.N. 851,620, Filed Nov. 14, 1977, Cl. 17/32, FOOD PATTY MOLDING MACHINE, Louis R. Richards, Owner of Record: *Formax, Inc., Mokena, Ill.,* Attorney or Agent: James B. Kinzer, et al., Ex. Gp.: 333

3,926,021, Re. S.N. 860,424, Filed Dec. 14, 1977, Cl. 70/278, ELECTRONIC COMBINATION LOCK AND SYSTEM, Leonard J. Genest, et al., Owner of Record: *Monitron Industries, Inc., Santa Ana, Calif.,* Attorney or Agent: M. John Carson, Ex. Gp.: 355

3,926,821, Re. S.N. 860,361, Filed Dec. 14, 1977, Cl. 252/467, PHOSPHORUS, NITROGEN AND SULFO-CONTAINING ADDITIVES, William Monroe Lesuer, Owner of Record: *The Lubrizol Corporation, Wickliffe, Ohio,* Attorney or Agent: James W. Adams, Jr., et al., Ex. Gp.: 116

3,933,758, Re. S.N. 847,936, Filed Nov. 2, 1977, Cl. 260/77.5 CH, IMINOIMIDAZOLIDINEDIONE AND PARABANIC ACID POLYMERS CONTAINING IMIDE GROUPS, Tad L. Patton, Owner of Record: *Exxon Research and Engineering Company, Linden, N.J.,* Attorney or Agent: Donald C. Caulfield, et al., Ex. Gp.: 141

3,938,112, Re. S.N. 855,816, Filed Nov. 30, 1977, Cl. 340/195, TUBULAR WHEEL SPEED SENSOR, Thomas A. Gee, Owner of Record: *Eaton Corporation, Cleveland, Ohio,* Attorney or Agent: Raywood H. Blanchard, et al., Ex. Gp.: 234

3,954,142, Re. S.N. 857,734, Filed Dec. 5, 1977, Cl. 166/307, ZONAL FRACTURE TREATMENT OF WELL FORMATIONS, Gene C. Broaddus, et al., Owner of Record: *Halliburton Company, Duncan, Okla.,* Attorney or Agent: John H. Tregoning, et al., Ex. Gp.: 354

3,958,476, Re. S.N. 860,398, Filed Dec. 14, 1977, Cl. 83/143, PUNCHING DEVICE WITH PUNCH RETAINER, Kenneth J. Bartha, Owner of Record: *Houdaill Industries, Inc., Buffalo, N.Y.,* Attorney or Agent: Benjamin H. Sherman, Ex. Gp.: 324

3,982,099, Re. S.N. 854,057, Filed Nov. 23, 1977, Cl. 219/544, BILATERAL HEATER UNIT AND METHOD OF CONSTRUCTION, John W. Churchill, Owner of Record: *Inventor,* Attorney or Agent: Paul M. Craig, Jr., et al., Ex. Gp.: 213

3,984,300, Re. S.N. 854,115, Filed Nov. 23, 1977, Cl. 204/192, SEMICONDUCTOR PATTERN DELINEATION BY SPUTTER ETCHING PROCESS, Otte Van Ommeren, Owner of Record: *U.S. Philips Corporation, New York, N.Y.,* Attorney or Agent: Frank R. Trifari, Ex. Gp.: 114

3,995,185, Re. S.N. 855,594, Filed Nov. 28, 1977, Cl. 313/217, DISPLAY PANEL, Donald E. Miller, Owner of Record: *Burroughs Corporation, Detroit, Mich.,* Attorney or Agent: Robert A. Green, Ex. Gp.: 252

4,012,804, Re. S.N. 854,499, Filed Nov. 23, 1977, Cl. 14/71.3, ELECTROMECHANICALLY OPERATED DOCKBOARD, John C. Catlett, Owner of Record: *Kelley Company Inc., Milwaukee, Wis.,* Attorney or Agent: Elwin A. Andrus, et al., Ex. Gp.: 352

4,023,436, Re. S.N. 858,951, Filed Dec. 9, 1977, Cl. 74/551.3, ARTICULATED HANDLEBARS FOR BICYCLES AND THE LIKE, Peter W. Dodge, Owner of Record: *Inventor,* Attorney or Agent: Tab. T. Thein, Ex. Gp.: 345

4,031,787, Re. S.N. 860,399, Filed Dec. 14, 1977, Cl. 83/140, PUNCH AND STRIPPER ASSEMBLY, Percy Luther Cady, Owner of Record: *Houdaille Industries, Inc., Buffalo, N.Y.,* Attorney or Agent: Benjamin H. Sherman, et al., Ex. Gp.: 324

4,036,117, Re. S.N. 853,959, Filed Nov. 22, 1977, Cl. 93/51 R, PACKING MACHINES, Robert W. Davies, et al., Owner of Record: *Molins Limited, London, England,* Attorney or Agent: John C. Smith, Jr., Ex. Gp.: 325

PATENT NOTICES

Certificates of Correction for the Week of Feb. 14, 1978

Re. 28,957	4,029,912	4,043,200	4,051,411
Re. 29,312	4,029,975	4,043,392	4,051,464
Re. 29,408	4,031,081	4,043,407	4,051,609
Re. 29,422	4,032,083	4,043,677	4,051,671
D241,511	4,032,471	4,044,641	4,052,291
D242,267	4,032,510	4,044,656	4,052,557
D245,801	4,032,738	4,045,576	4,052,590
D245,899	4,033,066	4,045,589	4,052,720
3,855,270	4,033,285	4,045,636	4,052,722
3,869,986	4,033,533	4,046,068	4,052,895
3,912,682	4,033,685	4,046,071	4,053,076
3,929,801	4,033,762	4,046,222	4,053,098
3,963,718	4,033,927	4,046,230	4,053,220
3,974,195	4,034,483	4,046,744	4,053,242
3,979,414	4,034,708	4,046,750	4,053,247
3,984,637	4,035,223	4,047,250	4,053,304
3,989,474	4,035,237	4,047,615	4,053,316
3,997,760	4,035,385	4,047,945	4,053,388
3,998,562	4,035,386	4,047,947	4,053,390
4,001,441	4,035,393	4,048,000	4,053,425
4,003,971	4,035,983	4,048,053	4,053,472
4,006,310	4,036,456	4,048,195	4,053,514
4,008,483	4,036,650	4,048,237	4,053,602
4,009,107	4,036,995	4,048,703	4,053,835
4,009,661	4,037,537	4,049,467	4,054,690
4,015,721	4,038,320	4,049,694	4,054,731
4,017,391	4,038,331	4,049,804	4,054,744
4,017,514	4,038,496	4,049,839	4,054,772
4,017,714	4,038,815	4,049,912	4,054,799
4,020,285	4,039,208	4,049,970	4,055,226
4,021,112	4,039,436	4,050,023	4,055,377
4,021,147	4,039,566	4,050,082	4,055,752
4,021,467	4,039,675	4,050,207	4,055,854
4,021,837	4,040,530	4,050,209	4,056,018
4,021,927	4,040,976	4,050,302	4,056,153
4,022,927	4,041,073	4,050,348	4,056,738
4,024,636	4,041,094	4,050,352	4,056,763
4,026,254	4,041,178	4,050,423	4,056,865
4,027,883	4,041,260	4,050,634	4,056,953
4,028,694	4,041,572	4,050,752	4,057,212
4,029,264	4,042,073	4,050,763	4,057,596
4,029,753	4,042,380	4,050,805	4,057,893
4,029,779	4,042,625	4,050,809	4,058,175
4,029,794	4,042,692	4,050,911	
4,029,814	4,042,709	4,050,915	
4,029,865	4,042,712	4,050,922	

Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,647,747, C. A. Bialous, HIGH TEMPERATURE MOLDING FLAME RETARDANT POLYCARBONATE COMPOSITION, Interference No. 98,896, decided Oct. 11, 1977, claims 1, 2, 4, 5 and 6.

Patent No. 3,731,785, G. L. Stuart, METHOD AND APPARATUS FOR FORMING TYNE LAYERS IN AUTOMATIC BRICK STACKING SYSTEMS, Interference No. 98,724, decided Oct. 25, 1977, claims 1, 5, 6 and 7.

Patent No. 3,733,399, J. G. Becker, R. L. Mitchell and W. G. Pierson, ORAL COMPOSITIONS CONTAINING AN ENZYME, Interference No. 98,611, decided Oct. 4, 1977, claims 1, 2, 5, 6 and 12.

Patent No. 3,764,950, P. S. Wallia, METHODS FOR MAKING SEMICONDUCTOR PRESSURE TRANSDUCERS AND THE RESULTING STRUCTURES, Interference No. 99,049, decided Nov. 9, 1977, claims 1–13.

Patent No. 3,774,902, E. F. C. Schulze, SHEET SEPARATOR WITH INCREASED POCKET OPENING, Interference No. 98,859, decided July 27, 1977, claim 1.

Patent No. 3,781,184, J. J. Domicone, SAFE BI-MODAL WINDSHIELDS, Interference No. 98,949, decided Sept. 21, 1977, claim 1.

Patent No. 3,792,466, E. H. Arnold and D. L. McLaughlin, KEYBOARD ENTRY SYSTEM WITH N-KEY ROLLOVER AND N-KEY LOCKOUT PROTECTION, Interference No. 99,058, decided Oct. 25, 1977, claims 18, 19 and 20.

Patent No. 3,792,466, E. H. Arnold and D. L. McLaughlin, KEYBOARD ENTRY SYSTEM WITH N-KEY ROLLOVER AND N-KEY LOCKOUT PROTECTION, Interference No. 99,489, decided Oct. 25, 1977, claims 18 and 19.

Patent No. 3,792,466, E. H. Arnold and D. L. McLaughlin, KEYBOARD ENTRY SYSTEM WITH N-KEY ROLLOVER AND N-KEY LOCKOUT PROTECTION, Interference No. 99,490, decided Oct. 25, 1977, claims 14, 15, 16 and 17.

Patent No. 3,848,594, K. B. Buell, TAPE FASTENING SYSTEM FOR DISPOSABLE DIAPER, Interference No. 99,051, decided July 29, 1977, claims 1–16 and 19–21.

Patent No. 3,848,595, D. D. Endres, PREFOLDED DIAPER WITH IMPROVED LEG FIT, Interference No. 99,193, decided Nov. 17, 1977, claims 1, 3, 4 and 5.

Patent No. 3,851,770, C. Jenkins and J. R. Woolslayer, PIVOTED WELL DRILLING MAST AND SEPARATE TOWER, Interference No. 99,159, decided Sept. 21, 1977, claims 1 and 3–7.

Patent No. 3,885,951, W. Hofer, K. Lurssen and R. R. Schmidt, PLANT GROWTH REGULANT COMPOSITIONS CONTAINING 2-HALOETHANESULPHINIC ACID COMPOUNDS, Interference No. 99,221, decided Oct. 4, 1977, claims 1 and 9.

Patent No. 3,890,314, T. Ishimaru and Y. Kodama, PROCESS FOR PRODUCING 7 - ACYLAMINO - 3 - METHYL-3-CEPHEM-4-CARBOXYLIC ACIDS, Interference No. 99,610, decided Oct. 27, 1977, claim 10.

Patent No. 3,900,639, R. Lauterbach, METHOD FOR COATING SURFACES OF A WORKPIECE BY SPRAYING ON A COATING SUBSTANCE, Interference No. 99,514, decided Nov. 1, 1977, claims 1 and 2.

Patent No. 3,997,811, E. M. Tom and R. L. Vogelpohl, COLOR TELEVISION TUBE STRUCTURE AND METHOD OF MANUFACTURE, Interference No. 99,612, decided Nov. 4, 1977, claims 1, 3, 4, 5, 6, 7, 17, 18 and 24.

Disclaimers

3,751,199.—*Luke Alexander Toft*, Swansea, Wales. PRESSURE KILN SEAL. Patent dated Aug. 7, 1973. Disclaimer filed Nov. 1, 1977, by the assignee, *The International Nickel Company, Inc.*

Hereby enters this disclaimer to claim 1 of said patent.

3,918,254.—*Donald E. Wernberg*, Rockford, Ill. FUEL CONTROL FOR A GAS TURBINE HAVING AUXILIARY AIR BLEED. Patent dated Nov. 11, 1975. Disclaimer filed Dec. 1, 1977, by the assignee, *Woodward Governor Company.*

Hereby enters this disclaimer to claim 1 of said patent.

4,015,091.—*Tadikonda Narasimha Rao*, Morristown, N.J., and *Rouben Toumain*, Teheran, Iran. TELEPHONE RINGING GENERATORS. Patent dated Mar. 29, 1977. Disclaimer filed Nov. 21, 1977, by the assignee, *Bell Telephone Laboratories, Incorporated.*

Hereby enters this disclaimer to claims 6, 7, and 11 of said patent.

4,025,407.—*Wan-Hsuan Chang* and *Marco Wismer*, Gibsonia, Pa. METHOD FOR PREPARING HIGH SOLIDS FILMS EMPLOYING A PLURALITY OF CURING MECHANISMS. Patent dated May 24, 1977. Disclaimer filed Nov. 10, 1977, by the assignee, *PPG Industries, Inc.*

Hereby enters this disclaimer to claims 1, 2, 3, 4, 6, 7, 14, and 15 of said patent.

4,040,251.—*Arnold M. Heitmann*, Swampscott, *Walter L. Brassert* Belmont, and *Donald N. Chouinard*, Peabody, Mass. GAS TURBINE COMBUSTION CHAMBER ARRANGEMENT. Patent dated Aug. 9, 1977. Disclaimer filed July 20, 1977, by the assignee, *Northern Research and Engineering Corporation.*

The term of this patent subsequent to Aug. 2, 1994, has been disclaimed.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 14, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-9-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	2-11-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	7-14-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	1-10-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	3-7-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	9-13-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	8-2-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	2-7-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	5-20-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-3-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	5-6-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-3-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	4-4-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	1-3-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-6-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures: Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	4-22-77

Expiration of patents: The patents within the range of numbers indicated below expire during January 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,966,681 to 2,970,312, inclusive

Plant Patents..... Numbers 2,009 to 2,018, inclusive

REISSUES

FEBRUARY 14, 1978

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,536
MARKING TAG

Donald David Fearing, 942 Arbor, Mahtomedi, Minn. 55115

Original No. 3,934,368, dated Jan. 27, 1976, Ser. No. 472,085, May 22, 1974. Continuation-in-part of Ser. No. 216,489, Jan. 10, 1972, abandoned. Application for reissue Feb. 14, 1977, Ser. No. 768,149

Int. Cl.[2] **G09F** *3/04*

U.S. Cl. 40—301 **4 Claims**

2. A unitary livestock identification ear tag which can be readily folded from a normal configuration to a compact configuration for insertion into an animal's ear, following which it resiliently returns to said normal configuration for effective retention into place, said tag comprising an elongated flat body portion adapted to receive identification indicia, a neck section resiliently attached at one of its edges to said body portion along a first transverse junction, said neck section extending substantially perpendicular to said body portion in said normal configuration, said neck section being thin and substantially flat in cross-section and being of a length sufficient, but not greatly exceeding, the length necessary to accommodate the thickness of an animal's ear, an elongated anchoring head substantially equal in width to said neck section resiliently attached intermediate the ends of said anchoring head to the opposite edge of said neck section along a second transverse junction substantially parallel to said first junction, said anchoring head extending lengthwise only from said second junction substantially normal to said neck section and substantially parallel to said body portion in said normal configuration, said neck section being bendable along said first and second transverse junctions to position said neck into substantially coplanar relation to said body portion and to position one end of said anchoring head substantially parallel to and substantially contacting said neck section and the other end of said anchoring head outwardly beyond said neck section with said other end of said anchoring head substantially in the plane of said neck section, whereby said anchoring head is folded into a compact configuration with said neck section for insertion through a slit in an animal's ear and returns to normal configuration after insertion into the ear.

Re. 29,537
TORQUE BALANCED ROPE

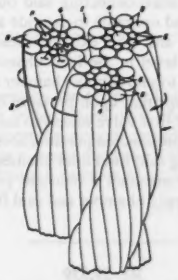
William E. Adams, Hamden, and Wilbert A. Lucht, Orange, both of Conn., assignors to United States Steel Corporation, Pittsburgh, Pa.

Original No. 3,374,619, dated Mar. 26, 1968, Ser. No. 545,726, Apr. 27, 1966. Application for reissue Aug. 24, 1976, Ser. No. 717,310

Int. Cl.[2] **D07B** *1/06;* **D02J** *13/00*

U.S. Cl. 57—148 **9 Claims**

1. A torque balanced regular lay *wire* rope comprising between three and six strands spiraled together, the angle of lay of the outer wires in each strand being at least [1¾] *2* times that of the angle of lay of the strands in the rope, *said rope being*



in the stress relieved condition, the torque exerted by the rope being approximately equal to the torque exerted by the strands.

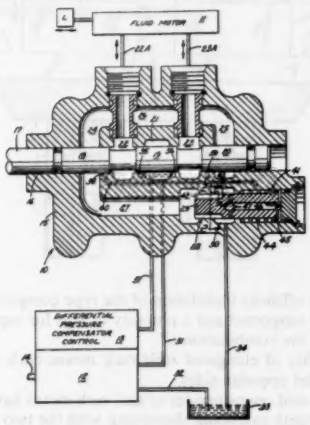
Re. 29,538
LOAD RESPONSIVE FLUID CONTROL VALVE

Tadeusz Budzich, 80 Murwood Drive, Moreland Hills, Ohio 44022

Original No. 3,744,517, dated July 10, 1973, Ser. No. 185,146, Sept. 30, 1971. Application for reissue May 9, 1975, Ser. No. 576,107

Int. Cl.[2] **F15B** *13/02, 13/08*

U.S. Cl. 137—596.2 **8 Claims**



1. A valve assembly comprising a housing having a fluid inlet chamber, [a] *at least one* fluid load chamber, a fluid outlet chamber, and a fluid exhaust means, *signal passage means between said load chamber and said outlet chamber,* first valve means for selectively interconnecting said load chamber with said inlet chamber, *said load chamber with said signal passage means, and said load chamber with said signal passage means* and said outlet chamber to meter fluid flow to and from said load chamber, and second valve means interconnecting said outlet chamber and said exhaust means, *said second valve means having means responsive to pressure in said signal passage means and pressure in said outlet chamber and* operable to maintain a constant pressure difference between said load chamber and said

outlet chamber when said load *chamber, said signal passage means* and *said* outlet chamber [s] are interconnected and said load chamber is pressurized.

11. A valve assembly comprising a housing having a fluid inlet chamber, a fluid supply chamber, first and second fluid load chambers, a fluid outlet chamber and fluid exhaust means, first valve means for selectively interconnecting said fluid load chambers with said fluid supply chamber and said fluid outlet chamber to meter fluid flow to and from said load chambers, second valve means interconnecting said outlet chamber and said exhaust means and operable to provide a passage between said outlet chamber and said exhaust means open above a preselected pressure level in the load chamber connected by said first valve means to said supply chamber and progressively reduce said passage opening upon pressure in said load chamber connected by said first valve means to said supply chamber dropping below said preselected pressure level, and third valve means interconnecting said fluid inlet chamber and said supply chamber operable to maintain a constant pressure difference between said fluid supply chamber and said fluid load chamber connected thereto.

Re. 29,539

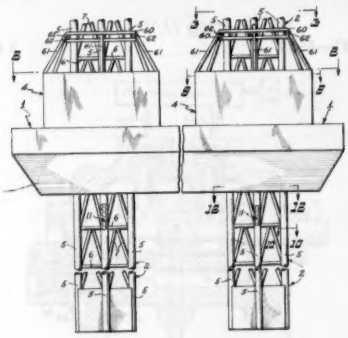
LEG SUPPORTED OFFSHORE STRUCTURE WITH JACKING APPARATUS

Herbert L. Willke, Houston, Tex., and James G. Abraham, Palos Verdes Peninsula, Calif., assignors to Armco Steel Corporation, Middletown, Ohio

Original No. 3,606,251, dated Sept. 20, 1971, Ser. No. 876,781, Nov. 14, 1969. Application for reissue Dec. 6, 1976, Ser. No. 747,802

Int. Cl.[2] B66F 7/12

U.S. Cl. 254—89 R **15 Claims**



1. In an offshore installation of the type comprising a structure to be supported and a plurality of legs for supporting the structure, the combination of

a plurality of elongated *rigid* rack means each having two parallel opposite sides,

each of said opposite sides of said rack means having a set of rack teeth extending therealong with the two sets of rack teeth of each rack means facing away from each other,

each of said rack means being secured to one of the legs in such fashion that both sets of teeth of the rack means are located outwardly [from] *of* the leg; [and]

a plurality of jacking units [mounted on the structure to be supported and] each cooperating with a different one of said rack means, each of said jacking units comprising

rigid frame means, two pinions each mounted on said frame means for rotation about a fixed axis, each of said pinions being operatively meshed with a different one of said two sets of rack teeth of the corresponding one of said rack means, [such meshed relation to said pinions with said teeth of said rack means, and the fact that said axes are fixed rigidly on said frame means, causing any force tending to disengage either of said pinions by movement away from the corresponding set of rack teeth to be opposed by reason of engagement of the other of said pinions with its corresponding set of rack teeth,]

rotary power means, and

gearing carried by said frame means and operatively connecting said power means to drive said pinions [.]*; and*

mounting means mounting said jacking units of the structure to be supported;

the meshed relation of said pinions with said teeth of said rack means, the rigidity of said frame means, and the fact that said axes are fixed rigidly on said frame means causing any force tending to disengage either of said pinions by movement away from the corresponding set of said rack teeth to be opposed by reason of engagement of the other of said pinions with its corresponding set of rack teeth, such opposition being effective via said rigid frame means and independent of said mounting means.

Re. 29,540

PHOSPHORYLATED ALKYLPHENOL/PHENOL ESTER MIXTURES

Donald Richard Randell, and Wilfred Pickles, both of Stockport, England, assignors to Ciba-Geigy AG, Basel, Switzerland

Original No. 3,576,923, dated Apr. 27, 1971, Ser. No. 645,888, June 14, 1967. Application for reissue July 10, 1973, Ser. No. 377,907

Claims priority, application United Kingdom, June 18, 1966, 27316/66

Int. Cl.[2] C07F 9/12

U.S. Cl. 260—966 **6 Claims**

1. A triaryl phosphate composition consisting essentially of a phosphorylated [alkylphenol/phenol] *isopropyl phenol/-phenol* ester mixture wherein the weight ratio of the [alkyl] *isopropyl* moiety to phenol moiety ranges from 0.05 to about 0.65 [and the number of carbon atoms per alkyl moiety ranges from 3 to 16] which ester is prepared by steps comprising:

(a) alkylating at a temperature of from about 15° to 250° C in the presence of a Lewis acid or a Bronsted acid as catalyst, phenol with an alkylating agent selected from the group consisting of alkyl halides in which the alkyl group is a C_1 to C_6 straight- or branched-chain alkyl or a C_6 to C_{12} cycloalkyl, C_1 to C_6 alkanols, and C_3–C_{16} olefins, with propylene to obtain an [alkylated phenol] *isopropyl phenol/phenol* reaction mixture *having 0.05 to about 0.65 by weight of isopropyl moiety per phenol moiety*, and

(b) reacting at a temperature of from about 15° to 250° C. in the presence of a Lewis acid as catalyst, said [alkylated phenol] *isopropyl phenol/phenol* reaction mixture with a phosphorylating agent selected from the group consisting of phosphorous oxychloride, phosphorous oxybromide and phosphoric acid.

PLANT PATENTS

GRANTED FEBRUARY 14, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,213

AFRICAN VIOLET PLANT

Reinhold Holtkamp, Weatherstrasse 112, 4294 Isselburg, Germany

Filed Nov. 18, 1976, Ser. No. 743,149
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet known by the cultivar name Delaware and particularly characterized as to uniqueness by the combined characteristics of upright and strong stems each of which supports 4–6 large flowers which are red in flower color and star-shaped; uniform flowering and compact growth habit, with continuous productivity of new flowers.

4,214

AFRICAN VIOLET PLANT

Reinhold Holtkamp, Weatherstrasse 112, 4294 Isselburg, Germany

Filed Mar. 3, 1977, Ser. No. 774,047
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet plant known by the cultivar name New Jersey and particularly characterized as to uniqueness by the combined characteristics of large pink flowers with frilled edges, with the flowers being non-dropping; long blooming period; upright and strong flower stems which form a bouquet above the leaves; and by the characteristic of being a saleable plant with the first flash of flowers.

4,215

GERANIUM PLANT

Frank Andrea, 390 N. Franklin St., Holbrook, Mass. 02343

Filed Mar. 11, 1977, Ser. No. 776,908
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of geranium plant, substantially as shown and described, characterized by its healthy growth; its continuous and exceptionally free blooming habits; its large and double flowered truss; its large florets with double petalage and distinctive color combination.

PATENTS

GRANTED FEBRUARY 14, 1978

ERRATA

For CLASS	See PATENT NO.
004-191	4,073,018
099-574	4,073,032
051-309 A	4,073,096
085-045	4,073,210
180-139	4,073,364
222-094	4,073,406
260-112 B	4,073,886
428-404	4,073,980
178-069.1	4,074,080
200-279	4,074,112
235-419	4,074,113
235-463	4,074,114
235-462	4,074,115
235-083	4,074,116
364-712	4,074,118
364-807	4,074,119
235-419	4,074,120
362-013	4,074,121
362-200	4,074,122
362-319	4,074,123
362-217	4,074,124
362-271	4,074,125
362-297	4,074,126
355-030	4,074,217
364-900	4,074,235
365-200	4,074,236
365-230	4,074,237
365-104	4,074,238
365-176	4,074,239
365-192	4,074,240
357-034	4,074,293

PATENTS

GRANTED FEBRUARY 14, 1978

ERRATA

PATENTS

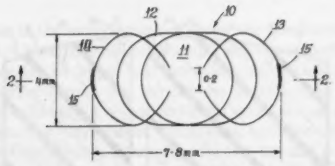
GRANTED FEBRUARY 14, 1978

GENERAL AND MECHANICAL

4,073,014
INTRA-OCULAR LENS
Stanley Poler, 78 E. Second St., New York, N.Y. 10003
Filed May 28, 1976, Ser. No. 691,033
Int. Cl.[2] A61F *1/16, 1/24*
U.S. Cl. 3—13 **29 Claims**

9. As an article of manufacture, a single-piece weld-free mounting adapter for iris-stabilized mounting of an intra-ocular lens element, comprising a circumferentially continuous ring body which is centrally open and which is of peripheral contour generally conforming to the peripheral contour of the lens element, plural inwardly extending angularly spaced anchoring elements integral with said ring body for engagement with spaced local peripheral regions of the lens, and first and second pluralities of lens-positioning feet integral with said ring body and radially outwardly extending therefrom in angularly spaced and interlaced relation, the feet of one plurality being in axially offset relation to the feet of the other plurality.

4,073,015
ARTIFICIAL INTRAOCULAR LENS ATTACHMENT
Gholam A. Peyman, 1044 N. Oak Park Ave., and Jeffrey E. Koziol, 1213 N. Lombard St., both of Oak Park, Ill. 60300
Continuation-in-part of Ser. No. 684,248, May 7, 1976, abandoned. This application Jan. 24, 1977, Ser. No. 762,007
Int. Cl.[2] A61F *1/16, 1/24*
U.S. Cl. 3—13 **7 Claims**

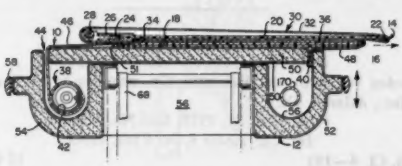


1. An artificial intraocular lens system adapted to be implanted within a living eye immediately adjacent the iris of the eye and comprising:

a plastic optical lens portion formed with a laterally extending haptical portion from said lens portion; and

attachment means including a biologically tolerable fibrous material mounted on the outer periphery of said haptical portion and adapted to contact the iris of the eye so that tissue growth of the iris into the fibrous material can occur for permanently anchoring said lens system within the eye.

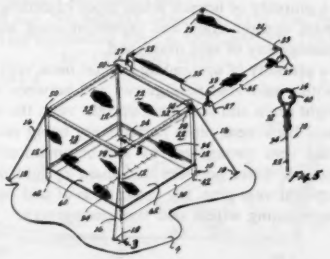
4,073,016
TRANSFER MECHANISM
Laurel A. Koll, Ruleville, Miss., assignor to Mobilizer Medical Products, Inc., Summit, N.J.
Filed June 17, 1976, Ser. No. 697,155
Int. Cl.[2] A47B *83/04*
U.S. Cl. 5—81 R **41 Claims**



1. In an object transfer mechanism having a load carrying deck with spaced front and rear edges, a translatable support having top and bottom surfaces and a front edge, the support being movable between a retracted position in which the support substantially overlies the deck and an extended position wherein the front edge of the support extends beyond the front edge of the deck, a flexible apron trained about at least the top and front edge surfaces of the support, and means for controlling movement of the apron relative to the support so that the flight portion of the apron trained along the top of the support may be selectively (a) maintained stationary relative to the deck during movement of the support relative to the deck and (b) moved with the support during translating movement thereof relative to the deck, the improvement comprising:

means for translating the support between the retracted position and a maximum extended position in which the front edge of the support is spaced beyond the front edge of the deck by a distance greater than the distance between the front and rear edges of the deck.

4,073,017
PORTABLE PLAYPEN
Amy L. Stevens, 1616 York Drive, Vista, Calif. 92083
Filed Oct. 26, 1976, Ser. No. 735,795
Int. Cl.[2] A47C *29/00*
U.S. Cl. 5—97 **8 Claims**



1. A portable playpen raised from the ground, comprising:

(a) an enclosure formed of pliable sheet material and having four side walls and a bottom wall in generally right-rectangular disposition and having an open top, at least the vertically intermediate and major portion of said side walls spaced from top and bottom margins being formed of netting so that a playpen occupant can see out through said netting,

(b) four upright posts located at the corners formed by adjacent side walls of said enclosure, the upper portion of

each post extending at least to a level near to the height of the upper edge of said enclosure,

(c) four horizontal top bars, each side wall having its upper margin secured to one of said bars which supports the same, the ends of said bars being secured to said upper portions of said posts, and

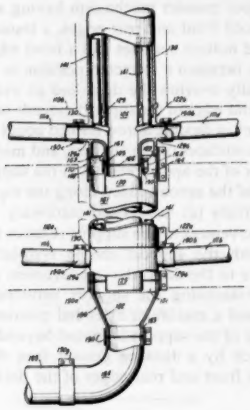
(d) a guy having one end secured to said upper portion of each post and a stake for each guy set in the ground at a location outlying said enclosure and secured to the other end of the associated guy to support the associated post against tilting inwardly of said enclosure.

4,073,018

INTERNAL BACK VENT SYSTEM

Gordon W. Arrowood, Palmetto, Ga., assignor to McKenney's, Inc., Atlanta, Ga.

Filed Mar. 31, 1975, Ser. No. 563,482
Int. Cl.[2] E03D 9/04; F16L 41/00
U.S. Cl. 4—191 **11 Claims**



1. A back vent drain system comprising:

a. a main upright drain for defining a drain passageway, therethrough;

(b) a main upright vent disposed adjacent to and surrounding said drain, said main vent and said main upright drain defining therebetween a vent passageway;

(c) a plurality of branch waste pipes extending through said main upright drain and communicating with said drain passageway of said drain; and

(d) a plurality of upstanding tubular back vent pipes wholly within said vent passageway and between said main upright drain and said main upright vent, the lower ends of said back vent pipes respectively being received within said vent passageway by and communicating with said branch waste between said main upright drain and said upright vent pipe, the upper ends of said back vent pipes terminating within said vent passageway.

4,073,019

LIGHTWEIGHT WATERBED ASSEMBLY

Peter Fraser, 99 Mount Auburn St., Cambridge, Mass. 02138

Filed Aug. 9, 1976, Ser. No. 712,550
Int. Cl.[2] A47C 27/08
U.S. Cl. 5—365 **3 Claims**

1. A lightweight waterbed assembly comprising

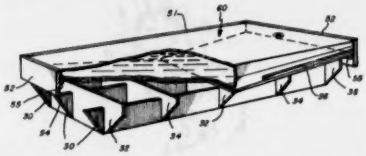
a fluid filled mattress and a substructure therefore,

said substructure including, a pair of planar sheets for engaging and supporting the bottom of said mattress,

a supporting frame comprising a lattice of interlocked members having upper edges positioned to support and engage said planar sheets in planes at an obtuse angle to one another,

a retaining frame having sides and ends defining a rectangular wall,

means supporting said retaining frame on said supporting frame with edges of said retaining frame extending above and other edges thereof extending at least partially below the outer edges of said planar sheets to define a cavity to receive said mattress with said cavity open at the top and with a non-uniformly deep bottom so that the maximum thickness of the mattress occurs in areas where maximum body support is required,



said mattress being fabricated of upper and lower water impervious sheets sealed at their peripheries, each of said water impervious sheets having a width which is greater intermediate the ends than at the ends,

said lower water impervious sheet conformed to the surfaces defined by said planar sheets and the walls of said retaining frame,

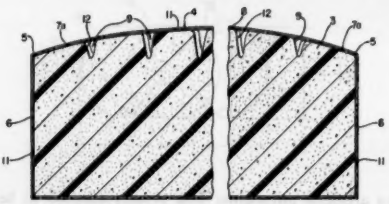
said lattice of interlocked members include two sets of flat elongated members with each elongated member having parallel longitudinal edges and a plurality of slots in one of said edges, said sets positioned normal to one another with one set above the other and with said slots of one set aligned and interlocked with the slots of the other set.

4,073,020

CONTOURED FOAM MATTRESS

Robert J. Stalter, Bowling Green, and Theodore B. Burkholder, Perrysburg, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 19, 1976, Ser. No. 678,011
Int. Cl.[2] A47C 27/04, 27/22
U.S. Cl. 5—355 **6 Claims**



1. A molded foam mattress of essentially a rectangular shape and having a crown, said crown being divided into a decorative segment by cored-out areas, said coring being positioned to give a geometric pattern of grooves that extend continuously in lengths no more than 4 inches before the grooves terminate or change directions to give raised portions relative to the groove, each portion being capable of being compressed independent of any other portion for at least 10 percent of its compression deflection.

4,073,021

DIFFERENTIAL-PRESSURE FLOTATION CUSHION

Richard S. Carlisle, P.O. Box 307, Rye, N.Y. 10580

Filed Mar. 3, 1976, Ser. No. 663,544
Int. Cl.[2] A47C *27/08*
U.S. Cl. 5—365 9 Claims

1. A compartmented, fluid containing cushion for a person comprising

an inner multiple compartmented cushion containing fluid at a positive pressure sufficient to support a person; and

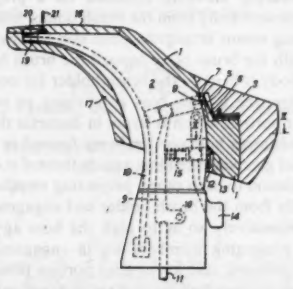
an outer fluid containing envelope enclosing said inner multiple compartmented cushion, said outer envelope containing fluid at a pressure which is selected sufficiently low to enable a portion of said outer envelope to undulate upwardly for support of a certain area of a person while another portion of said outer envelope is enabled to effectively rest upon said inner compartmented cushion for the latter's effective support of other areas of a person.

4,073,022

MANUFACTURE OF SHOES

Frank Gordon Bailey, Kettering, and George Trevor Ralphs, Bath, both of England, assignors to C. & J. Clark Ltd., England

Filed June 25, 1976, Ser. No. 699,808
Claims priority, application United Kingdom, June 25, 1975, 27010/75
Int. Cl.[2] A43D *3/00*
U.S. Cl. 12—135 A 9 Claims



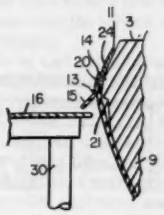
1. For use in the manufacture of shoes, the combination of a last and a last post, the last comprising a main body portion and the post having an upper end portion, one of said portions having a socket therein of a noncircular cross-section and the other portion having a spigot having a cross-sectional shape complementary to said socket and mating with the socket for locating and detachably mounting said last on said post, said last further comprising a heel part slidably mountable on said body portion for sliding a distance for removing said heel part from said body portion, a rib and a mating groove formed one on the body portion and the other on the heel part, said rib and groove when interengaged mounting said heel part on said body portion in slidable engagement therewith, said body portion and said heel part respectively having surfaces thereon which abut when said heel part is slid to an operative position, a spring latch secured on said heel part and having a free end movable to engage an abutment on said body portion when said heel part is slid to its operative position, and means for moving said free end out of engagement with said abutment for releasing said heel part for removal from said body portion.

4,073,023

METHOD OF MANUFACTURE OF FOOTWEAR

Anton Liebscher, Waynesville; Sven Oberg, Lake Junaluska; Kenneth Smathers, and Horace Auberry, both of Waynesville, all of N.C., assignors to Ro-Search, Inc., Waynesville, N.C.

Division of Ser. No. 493,965, Aug. 1, 1974, Pat. No. 4,003,145.
This application Oct. 22, 1976, Ser. No. 734,879
Int. Cl.[2] A43D *21/00*
U.S. Cl. 12—142 RS 1 Claim



1. The method of manufacture of footwear with molded soles, comprising the steps of

securing an outward extending welt to the upper spaced substantially above the insole level,

securing string lasting means to said upper above the insole level,

string lasting said upper on the mold last of a sole molding device in its loading station,

positioning and maintaining the outward extending welt in its final position by means of a welt plate while removed from the sole molding device,

inspecting the shoe bottom and locking said welt plate in position relative to said mold last,

moving the unit of last, welt plate, and locking means into juxtaposition with the sole molding device,

clamping the edge of the outward extending welt between said welt plate and the edge of the sole molding device, while preventing the inwardly protruding edge of said welt plate from exerting horizontal pressure upon the upper and thereby preventing damage to said upper, and

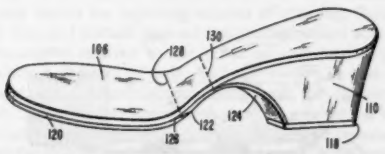
molding a sole to said welt.

4,073,024

METHOD OF MAKING A SHOE

Nathan Stix, Cincinnati, Ohio, assignor to The United States Shoe Corporation, Cincinnati, Ohio

Division of Ser. No. 665,832, March 11, 1976, Pat. No. 4,048,732. This application Mar. 4, 1977, Ser. No. 774,846
Int. Cl.[2] A43D *9/00*
U.S. Cl. 12—142 J 17 Claims



1. A method of constructing a shoe having a relatively flexible shank portion without shank reinforcement, comprising:

assembling an upper for said shoe;

slip lasting the forepart only of said shoe, the step of slip lasting including securing the forepart portion only of an insole to the forepart of said upper;

cement lasting the shank and heel seat portions of said insole to said upper;

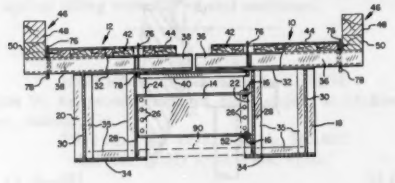
attaching a heel and an outsole to the bottom of said insole; and

interlocking said outsole, insole and heel by means of stitching extending across the shank portion of the shoe.

4,073,025
PORTABLE BRIDGE

William T. Peckham, Eugene, Oreg., assignor to Hamilton Construction Co., Springfield, Oreg.

Filed Feb. 22, 1977, Ser. No. 770,754
Int. Cl.[2] E01D *15/12*
U.S. Cl. 14—2.4 **12 Claims**



1. A portable bridge structure comprising:

two longitudinal bridge sections adapted for supporting heavy trucks and for releasable mounting in parallel spaced apart relationship in position to span an area to be covered;

each bridge section comprising at least one upright elongated support member extending longitudinally of the bridge, a plurality of cross members extending across the top of said support member so that said support member is positioned intermediate the ends of said cross members and a bridge roadway portion provided on said cross members, said two bridge sections providing two separate roadway portions spaced apart when mounted at said area;

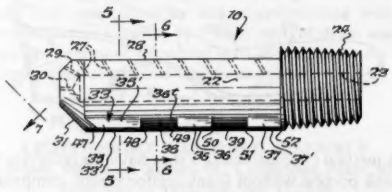
a plurality of rectangular diaphragm members spaced longitudinally along the support members and each pivoted at one end portion to one support member of one bridge section so that the free end portion may pivot toward and be releasably secured to the other support member of the second bridge section to join the bridge sections together when said bridge sections are mounted; and

releasable connection means for releasably securing said diaphragm members to said other support member to enable the bridge sections to be separated and transported from said area to another bridge site.

4,073,026
LANCE TIP CONSTRUCTION

Robert J. Goodwin, Hendersonville, N.C., assignor to C. H. Heist Corporation, Clearwater, Fla.

Filed July 9, 1976, Ser. No. 703,790
Int. Cl.[2] B08B *9/02*
U.S. Cl. 15—104.1 R **18 Claims**

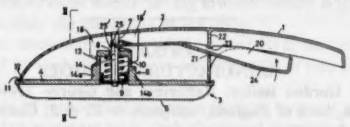


1. A tube cleaning lance tip construction for insertion into a tube comprising a body portion having a longitudinal axis and an outer surface, first bore means in said body portion for receiving high pressure fluid, second bore means in communication with said first bore means and extending through said body portion to said outer surface for causing fluid to be ejected with a net lateral force component to bias said body portion toward said tube, and a plurality of axially extending blade means with axial spaces therebetween on the opposite side of said body portion from said second bore means for engaging the inside of said tube.

4,073,027
CLEANING BRUSH

Teruya Tsuruzawa, Suita, and Muneyuki Ueda, Nishinomiya, both of Japan, assignors to Nippon Seal Co., Ltd., Osaka, Japan

Filed Dec. 28, 1976, Ser. No. 755,042
Claims priority, application Japan, Jan. 6, 1976, 51-1206
Int. Cl.[2] A46B *9/10*
U.S. Cl. 15—172 **5 Claims**

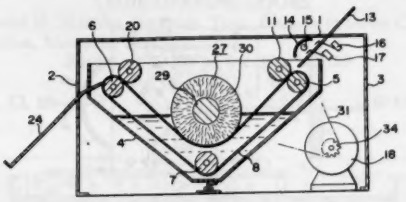


1. A cleaning brush which comprises a handle provided with a brush holder holding a brush body provided with a brush surface having numerous short bristles inclined in the same direction; a hollow boss provided on the back side of the brush body and within said brush holder and is rotatably, upwardly and downwardly movably mounted on a projection shaft extending downwardly from the brush holder into said hollow boss; a spring means arranged within said hollow boss to urge the boss with the brush body toward the brush holder so that the brush body is held on the brush holder for enabling brushing operation; the hollow boss comprising an upper portion and a lower portion which is larger in diameter than the upper portion; said lower boss portion being formed in its periphery with vertical grooves extending axially thereof in diametrically opposed relation to each other; projecting members extending downwardly from the brush holder and engageable with said grooves respectively so as to lock the boss against rotation when the projecting members are in engagement with the respective grooves; said lower boss portion being divided by said grooves into one-half circumferential sections each having a downwardly slanting top surface inclined circumferentially in the same direction; an actuating lever mounted on said holder and forked at its front end into two arms which extend above the upper boss portion; raised portions provided on the top face of the upper boss portion or on said arms; inclined surfaces provided on said arms or on the top face of the upper boss portion and cooperating with said raised portions; the arrangement being such that when the actuating lever is operated the boss together with the brush body is pressed down against the force of the spring and the projecting members are disengaged from the grooves to release the boss from locking whereupon the boss is somewhat rotated to allow the projecting members to ride on the slanting top surfaces on the lower boss portion so that when the actuating lever is released the projecting members slide down along the slanting top surfaces on the lower boss portion with a result that the boss together with the brush body is rotated to a complete 180° rotation and is moved upwardly to the position in which the boss is locked against rotation returned to the original position.

4,073,028
ETCHING PROCESSING APPARATUS

Akira Kakito, Hino; Junichi Yasui, Tama, and Yoji Koganei, Fussa, all of Japan, assignors to Iwatsu Electric Co., Ltd., Japan

Filed Aug. 2, 1976, Ser. No. 710,603
Claims priority, application Japan, Sept. 30, 1975, 50-118654
Int. Cl.[2] B41F *35/00*
U.S. Cl. 15—102 **5 Claims**



1. An etching processing apparatus for processing a lithographic master comprising:

an etching processing liquid vessel containing a bath of etching liquid;

an endless belt for conveying the lithographic master to be processed on a predetermined path through the etching processing liquid vessel and through the bath of etching liquid;

driving means for rotating the endless belt in a predetermined direction;

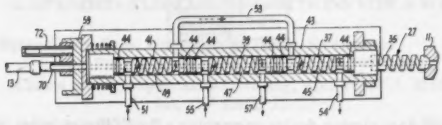
non-rotatable means disposed in the bath of etching liquid for frictionally rubbing a surface of the lithographic master being conveyed in the bath of etching liquid to render the surface of the lithographic master hydrophilic; and

means for maintaining adequate pressure between the non-rotatable means for frictionally rubbing a surface of the lithographic master and the endless belt.

4,073,029
PARTS CLEANER

Alphonse C. Vassallo, 1439 Wayland, San Francisco, Calif. 94134

Filed May 27, 1976, Ser. No. 690,407
Int. Cl.[2] B08B *7/04*
U.S. Cl. 15—302 **4 Claims**



1. A cleaner for cylindrical parts contaminated with oil or the like, said cleaner being adapted to be attached to a machine which ejects parts therefrom, comprising in combination:

a. a helix having a hollow, circular center opening through which said cylindrical parts can pass with a small clearance, said circular center opening being attached to the discharge of said machine whereby parts discharged from said machine will be pushed into said circular center opening, said helix being divided into four sections arranged in the following order;

b. a first section of said helix open to the air whereby parts passing through said circular center opening with small clearance have a substantial amount of oil scraped from said parts while going through said opening;

c. a second section of said helix, said second section being enclosed and having sealing means at each end thereof whereby only the circular center opening in said helix provides an opening at the ends of said section;

d. means for introducing an air-solvent mixture at one end of said second section and means for removing the air-solvent mixture from the opposite end of said section;

e. a third section of said helix having an enclosure thereabout with sealing means at each end thereof whereby said circular center opening provides the only opening at the ends of said enclosure and means for introducing a solvent into said third section near one end of said enclosure and for removing the solvent at the opposite end of said fourth enclosure;

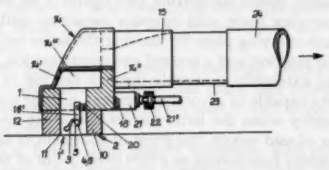
f. a fourth section of said helix having an enclosure thereabout with sealing means at each end of said section wherein said central opening provides the only opening at the ends of said fourth section and means for introducing an air blast into said section near one end thereof to remove adhering solvent from said parts and for removing air and solvent from said fourth section at the opposite end of said fourth section enclosure; and

g. an exit end of said circular opening whereby parts are discharged from the circular opening.

4,073,030
SUCTION CLEANING APPARATUS WITH A BAFFLE TO DIRECT FLOW OF A CLEANING FLUID

Hartmut Albishausen, Auf den 30 Morgen, 6382 Friedrichsdorf, Germany

Filed Sept. 14, 1976, Ser. No. 723,195
Claims priority, application Austria, Sept. 15, 1975, 7052/75
Int. Cl.[2] A47L *7/00*
U.S. Cl. 15—322 **13 Claims**



1. In an arrangement for cleaning planar and curved surfaces of textile material coverings on floors, walls, furniture and the like, of the type having a suction means and a cleaning fluid supply means, a combination comprising a portable cleaning head including a suction attachment connected to the suction means, an elongated intake opening lying in a plane and being juxtaposed with contaminated portions of a surface to be cleaned, and a suction channel extending intermediate said suction attachment and said intake opening for transmitting suction force from the suction means to the surface to be cleaned; means for injecting streams of cleaning fluid along paths into said suction channel at a predetermined acute angle of inclination relative to the plane of said intake opening, including a plurality of fluid discharge outlets in said suction channel, said outlets communicating with the cleaning fluid supply means and being spaced along a row which extends generally along the elongation of said intake opening; and means for directing a fluid curtain constituted by the respective streams towards said intake opening at a predetermined cleaning angle relative to the plane of said intake opening, including a baffle in said suction channel, said baffle being spaced from said outlets and extending generally along the row of said outlets, said baffle having a fluid-deflecting substantially planar portion which is located in the paths of the respective streams and which is inclined at said predetermined cleaning angle which is different from said predetermined angle of inclination of said streams for intercepting the respective streams and for directing the latter to flow for a distance along said substantially planar portion prior to impingement upon the surface to

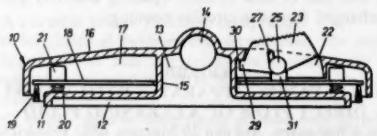
be cleaned, said baffle also having an enlarged rounded portion which extends in an arcuate path from said substantially planar portion and into said suction channel in direction away from the plane of said intake opening, said enlarged rounded portion being sufficiently rounded to direct the intercepted streams to flow at least in part along said arcuate path towards said suction attachment so as to prevent fluid from undesirably dripping onto the surface to be cleaned when said cleaning head is lifted therefrom.

4,073,031

VACUUM CLEANER NOZZLE WITH RETRACTABLE BRUSH

Osten Schwartz, Varmdo, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Mar. 15, 1976, Ser. No. 666,581
Claims priority, application Sweden, Mar. 26, 1975, 7503538
Int. Cl.² A47L 9/02
U.S. Cl. 15—373 **4 Claims**



1. A vacuum cleaner nozzle having a fixed open bottom part facing the surface to be cleaned, a brush carrying plate in said nozzle which is movable relative to said fixed bottom part and is utilized for cleaning another type of work surface, yieldable means urging said movable plate away from said bottom part, an operator, means supporting said operator on said movable brush carrying plate, said operator co-acting with said movable brush carrying plate for moving the latter between a first retracted position and a second extended position, said operator being externally accessible through the top of said nozzle and being capable of pivotal movement, a ledge on said operator whereby when the latter moves said ledge co-acts with a shoulder of said nozzle, the point of abutment of said ledge on said shoulder functioning as a first pivot point of said operator thereby permitting the latter to pivot, a vertical groove in at least part of said nozzle walls, said operator being provided with a shaft which is supported in said vertical groove, said shaft being provided with at least one projection, a recess in said nozzle walls for accommodating said projection, and in the second position of said movable plate said projection is released from said recess as said projection and operator are pivoted about a second point to thereby engage said projection with an abutment surface in said vertical groove whereby said movable plate is locked in its second extended position.

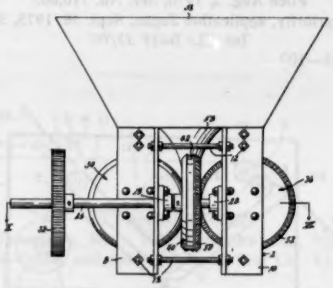
4,073,032

NUT CRACKING MACHINE

Ralph V. Packwood, Box 203, Exeter, Mo. 65647

Filed Nov. 24, 1976, Ser. No. 744,522
Int. Cl.² A23N 5/00
U.S. Cl. 99—574 **1 Claim**

1. A nut cracking machine comprising a frame, cracking means consisting of a plurality of wheels carried rotatably by said frame, the axes of said wheels forming a closed polygon lying in a horizontal plane, each of said wheels contacting the next adjacent wheels centrally of said polygon, and there being a groove of arcuate cross-sectional contour formed peripherally in each of said wheels, said grooves of all of said wheels conjointly forming a circular orifice having a vertical axis at the juncture of said wheels, there being at least four of said wheels, in which case the axes of said wheels form a square, and the groove in the periphery of each of said wheels is on 90° angular extend in cross-sectional contour, gravity means operable to feed nuts and nut fragments to be cracked downwardly between said wheels to said orifice, said nuts and fragments being of non-circular cross-sectional and having a major dimension greater than the diameter of said orifice, and power means operable to rotate all of said wheels at equal speeds in



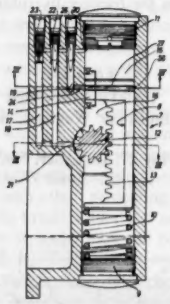
such directions that the portions of their peripheries defining said orifice at any given moment downwardly with respect to said orifice, whereby said nuts and fragments are drawn through said orifice and cracked by pressure across the major dimensions thereof.

4,073,033

DOOR CLOSING DEVICE

Sven-Olof Lexnäs, Vastra Frolunda, Sweden, assignor to Stilexo Johansson & Co. Aktiebolag, Skillingaryd, Sweden

Filed Feb. 13, 1976, Ser. No. 658,126
Claims priority, application Sweden, Feb. 14, 1975, 7501659
Int. Cl.² E05F 3/10
U.S. Cl. 16—52 **3 Claims**



1. A door closing device comprising a fluid filled cylinder, a piston within said cylinder forming a first and second chambers and slidable in opposite directions, an arm and gear mechanism connected to the piston and adapted to be further connected to a pivotable door in order to transmit opening and closing movements of the door to the piston and vice versa, a sealing ring of metallic material positioned in a groove at one end of said piston, said sealing ring being open and expandable against the wall of said cylinder, a spring forcibly biasing the piston in one of its slidable directions, first and second by-pass channels communicating through a first port with a first chamber formed by one extreme end of said piston and through a second port with the second chamber formed by said piston, said first by-pass channel being provided with a check valve arranged to permit the free-flow of fluid in a direction caused by the piston sliding against the bias of the spring and to check the flow of fluid in the opposite direction, said second by-pass channel being provided with a throttle valve arranged to retard the

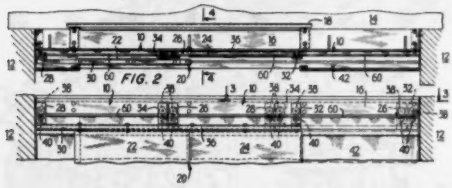
flow of fluid in both directions, a third by-pass channel communicating said first port and said first chamber with a third port positioned between said first and second ports and at a distance with respect to the distance travelled by the sealing ring to permit intermittent communication of said third port with said first chamber.

4,073,034

DOOR-SUPPORTING SYSTEM FOR MULTIPANEL, SIDE-OPENING DOORS

Edward W. Martens, Memphis, Tenn., assignor to Dover Corporation, Memphis, Tenn.

Filed Sept. 13, 1976, Ser. No. 722,729
Int. Cl.² E05D *13/02*
U.S. Cl. 16—87 B **10 Claims**



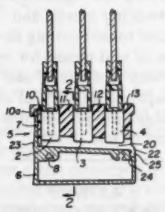
1. In a door-supporting system for a side-opening door, having a multiplicity of individual panels arranged parallel to one another, all the panels being capable of traveling in a first direction to open the door and in a second direction, opposite of the first direction, to close the door, each individual panel traveling a different distance than an adjacent panel during opening and closing of the door, the improvement comprising a single track and means for supporting each panel from said track, said supporting means including a multiplicity of pairs of spaced-apart hangers mounted from said track, each panel having a corresponding pair of said spaced-apart hangers attached thereto, one hanger of each panel being positioned for travel along said track between the hangers of an adjacent panel during opening and closing of the door, the hangers of said corresponding pair of spaced-apart hangers being spaced apart a distance at least equal to the width of the corresponding panel plus the width of the hanger of the adjacent panel positioned therebetween.

4,073,035

LOWER GUIDE MEMBER FOR ADJACENTLY SUSPENDED, SLIDEABLE PARTITIONS FOR A WET CHAMBER

Heinz Georg Baus, Ulmenweg 46, Thun, Switzerland

Filed Apr. 16, 1976, Ser. No. 677,797
Claims priority, application Germany, Apr. 17, 1975, 2516851
Int. Cl.² E05D *13/02*
U.S. Cl. 16—96 R **6 Claims**



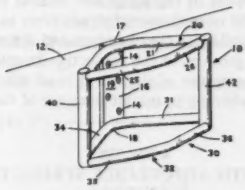
1. Lower guide member for adjacently suspended, slideable partitions for a wet chamber comprising a compensating member seatable on the edge of a wet-chamber tub and having a hollow profile, means providing an upper surface for said compensating member decreasing in elevation toward the wet chamber, and a removable elongated guide rail secured to said compensating member, said compensating member being closed at said upper surface and having a lateral longitudinal side with a wall extending along said lateral longitudinal side at said upper surface, said guide rail overlapping said wall and comprising parallel U-shaped guides, guide walls respectively bordering said guides and connected to one another, and connecting bars extending perpendicularly to said U-shaped guides, said connecting bars being disposed on said upper surface, said guide rail being formed with water outlet openings directed toward the wet chamber.

4,073,036

MULTI-WAY GRAB RAIL

Leopold Bustin, Emmans Road, Flanders, N.J. 07836

Filed Jan. 19, 1977, Ser. No. 760,363
Int. Cl.² B60N *3/02*
U.S. Cl. 16—110 R **5 Claims**



1. A multi-grab handle comprising:

a. a base plate, said base plate having an upper end, a lower end and a front surface;

b. a first grab handle element extending generally normally to said surface of said base plate, said first grab handle element being rigidly secured to said upper end of said base plate;

c. a second grab handle element extending generally normally to said surface of said base plate, said second grab handle element being rigidly secured to said lower end of said base plate; and

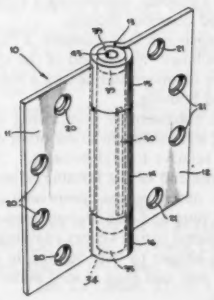
d. third and fourth grab handle elements, said third and fourth grab hand elements comprising spaced generally parallel bars extending between and rigidly secured to said first and second grab handle elements.

4,073,037

HINGE PINTLE RETAINING MEANS

Edward G. Curry, and Vernard W. Sanders, both of Los Angeles, Calif., assignors to Henry Soss and Company, Los Angeles, Calif.

Filed Oct. 7, 1976, Ser. No. 730,340
Int. Cl.² E05D *5/12*; E05F *1/14, 3/20*
U.S. Cl. 16—169 **7 Claims**



1. A hinge assembly comprising a pair of hinge leaves having

knuckles on the respective leaves in axial alignment, each knuckle having a chamber in axial alignment with the chamber in the other knuckle, said leaves having collapsed positions, normal extended positions, and positions in excess of said normal extended positions,

a unitary self contained pintle subassembly adapted for reception in said chambers to serve as a pivot for said hinge assembly, said pintle subassembly comprising a tubular housing having a length not less than the aggregate length of adjacent knuckles and extending throughout said aggregate length, said tubular housing providing interior space for a spring motor,

a keying rib attached to and extending axially along the exterior of said tubular housing at a location intermediate opposite ends,

a groove in each of the knuckles, the groove in one of said knuckles being open at both ends and the groove in the other knuckle being open at only one end,

said grooves being in axial alignment with each other only when the leaves of the hinge are rotated to positions in excess of said normal extended positions to enable insertion of the pintle into the chambers and the accompanying rib into the grooves of the respective knuckles,

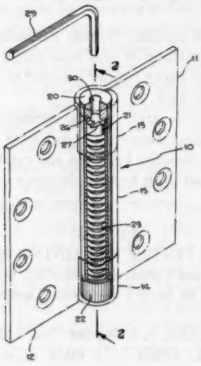
said grooves being out of alignment in all other positions of the leaves whereby to inhibit removal of the pintle.

4,073,038

PINTLE WITH ADJUSTABLE SPRING TENSION MOTOR

Edward G. Curry, and Vernard W. Sanders, both of Los Angeles, Calif., assignors to Henry Soss and Company, Los Angeles, Calif.

Filed Oct. 7, 1976, Ser. No. 730,341
Int. Cl.[2] E05F *1/12*
U.S. Cl. 16—189 **11 Claims**



1. A separate torsion spring motor unit, for action between pivotally mounted elements, comprising a cylindrical housing having an elongated chamber therein,

a coiled torsion spring in said chamber, a first spring keeper having an attachment to one end of the spring at an adjacent end of the chamber and having a rotatable mounting relative to said housing,

a spring tension subassembly comprising a second spring keeper having an attachment to the other end of the spring and rotatable relative to said housing,

a plug fixed to the end of the housing adjacent said second spring keeper, detent means comprising elements respectively on said plug and said second spring keeper,

means on said second spring keeper enabling rotation of said second spring keeper to vary tension in said spring, and access means past said plug to said means on said second spring keeper,

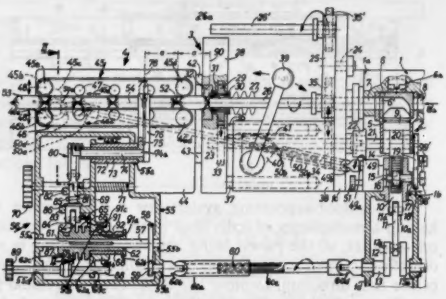
said detent means having a blocking engagement in one rotational direction whereby to maintain spring tension and being yieldable in the opposite rotational direction whereby to enable rotation to increase spring tension, said detent means being yieldable in an axial direction whereby to enable a release of detent action and effect a variable decrease in spring tension.

4,073,039

APPARATUS FOR THE PRODUCTION OF SAUSAGE

Johann Müller, Biberach; Hans Ernst Weerth, Winterstettenstadt, and Georg Staudenrausch, Biberach-Rissegg, all of Germany, assignors to Albert Handtmann, Biberach, Germany

Filed Feb. 2, 1977, Ser. No. 764,990
Claims priority, application Germany, Feb. 13, 1976, 2605745
Int. Cl.[2] A22C *11/00*
U.S. Cl. 17—1 F **12 Claims**



1. An apparatus for producing links of sausage of equal length and equal weight, comprising:

a housing;

dosaging pump means on said housing for displacing masses of sausage filling in a predetermined cadence;

a filling tube adapted to carry a loose length of sausage casing and connectable with said pump means for feeding the sausage filling into said casing and forming links of sausage therein;

twisting means at a downstream end of said tube for twisting said casing between the links of sausage, said twisting means operating substantially in the cadence of said pump means;

a conveyor on said support downstream of said twisting means defining a transport path for sausage links separated by twisted portions of said sausage casing said transport path having an upstream end and a downstream end;

a cutting device on said support along said transport path between the ends thereof of said conveyor for severing selected lengths from one another at the twisted portion therebetween;

mechanism for varying the distance between said cutting device and said twisting means; and

an actuator connected to said cutting device and operatively connected to one of said means for operating said device in synchronism with said one of said means for severing said portion to separate an integral number of links from the chain of sausage links produced at said twisting means for each operation of said device.

4,073,040

MACHINE FOR PROCESS OF POULTRY GIZZARDS

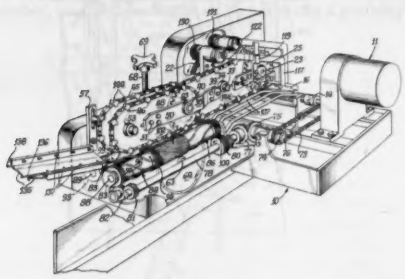
Carl J. Hill, Rte. 2, Ball Ground, Ga. 30107

Filed Aug. 13, 1975, Ser. No. 604,165
Int. Cl.[2] A22C *17/14*
U.S. Cl. 17—43 **21 Claims**

1. In a machine for processing a poultry gizzard having the stomach attached thereto and comprising a first device at a

first station for detaching the stomach, a second device including a blade rotating on a shaft at a second station for slitting one side of the gizzard, a third device at a third station for separating the sides of the gizzard at said split to expose the interior of the gizzard, means for moving the gizzard sequentially from the first to the third station, and power means for operating said devices, the improvement comprising:

said first device comprising a first pair of rolls, each having an axis, positioned in juxtaposition with their axes parallel and approximately horizontal, said power means rotating said rolls in directions such that the tops thereof are turning toward each other;



said third device comprising a second pair of rolls, each having an axis, positioned in juxtaposition with their axes parallel and approximately horizontal, the rolls of the second pair being coaxial with the rolls of the first pair, said power means rotating the second pair of rolls in directions such that the tops thereof are turning away from each other;

said blade shaft being below said second pair of rolls with the blade extending upwardly between the second pair of rolls at least to the elevation of the tops thereof; and

said moving means having a portion above the rolls and generally parallel to said axes and engaging the gizzard to move the gizzard parallel to the axes and hold the gizzard against the tops of said rolls.

4,073,041

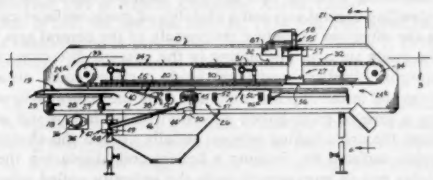
CRAB BUTCHERING MACHINE

Walter L. Davis, and Henry V. Svehaug, both of Milton-Freewater, Oreg., assignors to Applied Magnetics, Inc., Goleta, Calif.

Filed Aug. 30, 1976, Ser. No. 719,075

Int. Cl.[2] A22C *29/04, 25/08*

U.S. Cl. 17—71 **6 Claims**



1. A crab butchering machine, comprising:

an elongated crab support means for slidably supporting a crab carcass at points thereon between its carapace and the proximal articulation of its legs with the carapace facing downwardly;

an overhead endless chain conveyor having lugs thereon for engaging and sliding successive crabs along the elongated crab support means in a prescribed path from an infeed station to a discharge station;

carapace removing means along the prescribed path for performing the carapace removal operation as the crab is slid along the path exposing the crab body including the viscera and the gills;

viscera removing means along the path and beneath the crab support means for performing the viscera removal operation as the crab is moved along the prescribed path;

a pair of rotatable gill removing brushes beneath the crab support means on opposite sides of the path and powered to rotate about axes for performing the gill removal operation;

biasing means for yieldably urging the brushes inward against the crab body with the brushes following the contours of the crab body to efficiently remove the gills without damaging the body;

leg severing means along the path for performing the leg severing operation; and

control means for varying the speed of the conveying means to increase the rate of movement of the crabs between the removal and severing operations and to decrease the rate of movement of the crabs during the removal and severing operations.

4,073,042

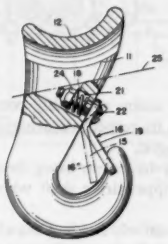
SAFETY HOOK

Franklin L. Miller, Portland, Oreg., assignor to Esco Corporation, Portland, Oreg.

Filed Nov. 26, 1975, Ser. No. 635,763

Int. Cl.[2] A44B *13/02*

U.S. Cl. 24—241 P **2 Claims**



1. A safety hook comprising a unitary body having a shank curving downwardly and forwardly into a bill with the upper end of said bill being in spaced relation to said shank to provide a throat,

said body at the upper end thereof being equipped with a passageway adapted to receive a wire rope, said passageway extending from the rear of said body forwardly therethrough, said passageway being relatively elongated and being longitudinally arcuate,

a latch member pivotally mounted on said shank and extending across said throat in a first position to releasably engage said bill to close said throat,

a bolt pivotally securing said latch member to said shank for arcuate movement of said latch member to a second position upon said bill,

said passageway having a smooth upper wall and a lower wall interrupted to provide a forwardly extending recess terminating in a bolt-receiving opening, said bolt extending through said opening into said recess, and

a spring and nut in said recess mounted on said bolt, said recess being constructed and arranged relative to said nut and bolt so as to shield the same from a wire rope in said passageway.

4,073,043

DRIVE SYSTEM FOR NAPPER MACHINE STRIPPERS

Vander B. Lowder, 320 Bypass - 29 North, Concord, N.C. 28025

Filed Mar. 9, 1977, Ser. No. 775,881

Int. Cl.[2] D06C *11/00*

U.S. Cl. 26—33 **4 Claims**

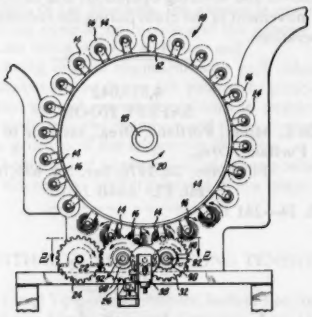
1. In a cloth napper apparatus including rotatable napper

rollers carried by a rotatable annular carrier, and at least a pair of napper stripper drive shafts interconnected by drive gearing to each other and to a drive means for the carrier, the improvement comprising:

(a) each stripper drive shaft having a stripper drive gear coaxially mounted thereon, the stripper drive gears being engaged with one another;

(b) at least one input drive gear engaged with one of the stripper drive gears, and drivingly connected to the carrier drive means in a manner enabling timed rotation of the stripper drive shafts with respect to the carrier;

(c) separate and independent overload release clutch means mounted on each stripper drive shaft;



(d) each clutch means releasably connecting each stripper drive gear to its respective drive shaft when the clutch means is engaged;

(e) each stripper drive gear being freely rotatable about the respective stripper drive shaft when the clutch means is disengaged;

(f) means for positively holding the clutch in its disengaged position when it becomes disengaged;

(g) means for resetting the clutch to its engaged position from a disengaged position; and

(h) means for preventing resetting of the clutch means to its engaged position unless the respective stripper drive shaft and stripper drive gear connected to the clutch means are in a predetermined rotational angular relationship to each other.

4,073,044

APPARATUS FOR ASSEMBLING LOUVRED BLINDS

Gerardus Hendrikus Edixhoven, Voorschoten, Netherlands, assignor to Hunter Douglas International N.V., Willemstad, Netherlands Antilles

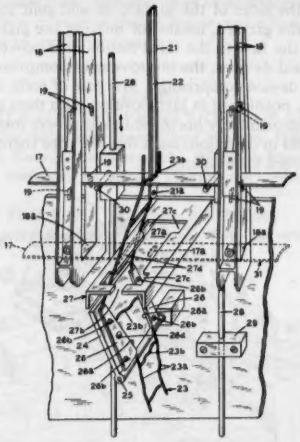
Filed Aug. 4, 1976, Ser. No. 711,446

Claims priority, application Germany, Aug. 8, 1975, 2535453

Int. Cl.[2] B23P *19/04*

U.S. Cl. 29—24.5 **13 Claims**

1. The method of assembling louvred blinds having louvres with holes therein, an elevating member, and a ladder having a pair of stringers with a plurality of rungs extending between said stringers comprising positioning a needle for threading the elevating member through holes in the louvres with the longitudinal axis of said needle vertical, guiding and positioning the ladder by means of a pivoted flap in guiding relationship with the ladder, inserting louvres successively between adjacent rungs of said ladder, raising each successive louvre after its insertion in said ladder to pass said needle through a hole in the louvre, raising of a louvre effecting upward movement of the ladder during at least a portion of the raising movement of the louvre, pivoting said flap to and between a first position in which said flap positions said ladder with a rung to one side of the vertical axis of said needle and a second position in which said flap positions the next successive rung of the ladder to the other side of said axis, and effecting the pivoting of said flap



solely and directly by forces exerted on said flap by said ladder during upward movements of said ladder.

4,073,045

CONVECTOR FOR HEATING ROOMS

Peter Heinrich Erwin Margen; Harry Evert Grimstedt, and Jan Anders Bosaeus, all of Nykoping, Sweden, assignors to Aktiebolaget Atomenergi, Stockholm, Sweden

Division of Ser. No. 433,003, Jan. 14, 1974, abandoned. This application Apr. 25, 1975, Ser. No. 571,846

Int. Cl.[2] B23P *15/26*

U.S. Cl. 29—157.3 C **9 Claims**

1. Method of manufacturing a convector for heating rooms comprising forming two uprights each having an upwardly extending central axis and a plurality of guide surfaces curved in the direction extending tranversely of the central axis with the guide surfaces alternating in the upward direction of the uprights, displacing adjacent guide surfaces equal distances from and in the opposite direction from the central axis, winding a tube of cross-linked polyethylene while it is still warm from the cross-linking process serially around the alternating guide surfaces for forming a helical coil, displacing the uprights out of engagement with the helically coiled tube and removing the uprights from within the coil.

4,073,046

SHOCK ABSORBER INSTALLATION TOOL

Frederick G. Ramsden, 157 Division St., East Greenwich, R.I. 02886

Filed Oct. 28, 1975, Ser. No. 626,540

Int. Cl.[2] B25B *27/14;* **B23P** *7/00*

U.S. Cl. 29—401 R **10 Claims**

1. A tool for installing shock absorbers comprising:

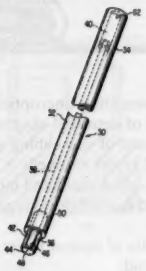
an elongated member, said elongated member having at its forward end a non-expandable bolt having disposed thereon a series of rearwardly facing projections said bolt and said rearwardly facing projections being of sufficient

size to seat in the inside opening of a shock absorber shaft such that upon retraction said rearwardly facing projections are forced into the metal confronting wall defining the inside opening in the top of a shock absorber's upper shaft, and a handle at the rearward end for guiding said upper shaft of said shock absorber into a shock absorber bearing support.

5. A tool for installing shock absorbers comprising:

(a) a hollow elongated member having at one end;

(b) an adjustable member for engaging the upper shaft of a shock absorber said adjustable member comprising a laterally expandable bolt disposed on said hollow elongated member, said bolt having at its forward end a plurality of



laterally expandable prongs, said prongs providing maximum lateral expansion at the terminal end of said expandable bolt;

(c) means for expanding said laterally expandable bolt, said means comprising a rod capable of forward and rearward actuation within said hollow elongated member wherein said forward and rearward actuation of said rod within said elongated member is provided by a screw assembly disposed in said elongated member and wherein the forward end of said rod provides bias against the internal sides of said prongs; and

(d) means at the other end of said hollow elongated member for guiding said upper shaft of said shock absorber into a shock absorber bearing support.

4,073,047

METHOD OF MAKING VIBRATION DAMPER

Byron L. Fishbaugh; Harold E. Keller, both of St. Marys, Ohio, and Lionel G. Stewart, N. Dartmouth, Mass., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 536,508, Dec. 26, 1974, Pat. No. 3,990,324, and a continuation-in-part of Ser. No. 449,159, March 7, 1974, abandoned. This application May 13, 1976, Ser. No. 685,965

Int. Cl.[2] B23P *11/02*

U.S. Cl. 29—450 **6 Claims**

1. A method of making a vibration damper for use with an oscillating body, said damper including an inner core member and an outer inertia ring member surrounding and axially spaced from said core member with a retaining band and a resilient damping elastomer disposed between said core and inertia ring members, said method comprising the steps of:

preparing the inner surface of the retaining band and the outer surface of the core;

applying a chemical adhesive system to said prepared surfaces;

placing the retaining band and the core members in a mold in concentric relative position such that an annular mold space exists between the core and the outwardly positioned band;

filling the annular mold space with damping elastomer, said mold characterized by having its end surfaces in a configuration for forming annular grooves in the finished elastomer upon vulcanization;

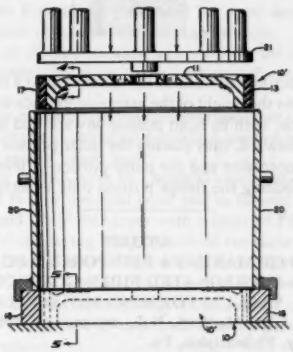
applying heat and pressure to said mold to vulcanize the elastomer and initiate a chemical bonding action between the elastomer and the confronting peripheral surfaces of the band and the core, said elastomer extending across the entire width of said band and core members to form an integrally assembled unit;

removing said assembled unit from the mold and force fitting said unit into the inertia ring such that the damping elastomer remains in a limited compressed condition.

3. A method of making a vibration damper for use with an oscillating body, said damper including an inner core member and an outer inertia ring member surrounding and axially spaced from said core member with a retaining band and a resilient damping elastomer disposed between said core and inertia ring members, said method comprising the steps of:

preparing the inner surface of the inertia ring and the outer surface of the retaining band;

applying a chemical adhesive system to said prepared surfaces;



placing the inertia ring and the retaining band in a mold in concentric relative position such that an annular mold space exists between the band and the outwardly positioned inertia ring;

filling the annular mold space with damping elastomer, said mold characterized by having its end surfaces in a configuration for forming annular grooves in the finished elastomer upon vulcanization;

applying heat and pressure to said mold to vulcanize the elastomer and initiate a chemical bonding action between the elastomer and the confronting peripheral surfaces of the inertia ring and retaining band members, said elastomer extending across the entire width of said band and inertia ring to form an integrally assembled unit;

removing said assembled unit from the mold and force fitting said unit onto the core member such that the damping elastomer remains in a limited compressed condition.

4,073,048

GASKET SEAL BETWEEN SEWER PIPE AND MANHOLE OPENING

John Ditcher, Langhorne, Pa., assignor to A-Lok Corporation, Trenton, N.J.

Filed July 30, 1976, Ser. No. 710,264

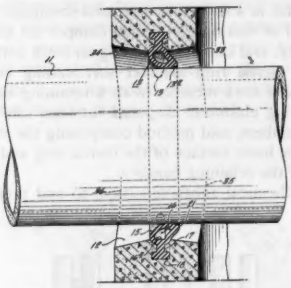
Int. Cl.[2] B23P *11/02*

U.S. Cl. 29—450 **5 Claims**

1. The method of constructing a disk-like gasket for sealing the space between a pipe and an opening through which the pipe passes, which method comprises the following procedures:

(a) Providing an extrusion of elastomeric material having, in cross section, the shape of a hollow, pear-shaped head integrated in a mid region of its lower part with a flange in the shape of an inverted "T", the height of said extrusion being greater than its width,

(b) Cutting the extrusion to a length approximating the outer circumference of the pipe,
(c) Vulcanizing the ends of the extrusion together to form a right cylinder, wherein the height of the extrusion extends in an axial direction,



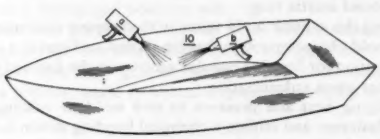
(d) Deflecting the walls of the cylinder into a disk-like form, wherein the height of the extrusion extends transversely of the axis, with its head portion inward and its flange portion outward, thus placing the inner portion of the gasket in compression and the outer portion in tension and
(e) Embedding the flange portion only in settable material.

4,073,049

METHOD OF MAKING A REINFORCED FOAM-FILLED RESIN-IMPREGNATED FIBER GLASS COVERED VACUUM FORMING MOLD PLUG

Robert E. Lint, Medford, N.J., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Jan. 27, 1975, Ser. No. 544,525
Int. Cl.[2] B29D *3/02*; B32B *31/06*; B29D *27/04*
U.S. Cl. 29—458 **7 Claims**



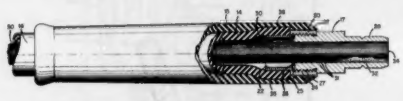
1. A method for making a mold suitable for vacuum thermoforming, compressing:
a. forming a polyester gel coat on a master pattern;
b. applying a rigidizing mixture of a thermosetting resin and glass fiber to said gel coat and curing said resin;
c. constructing and bonding on egg crate framework to the rigid layer, said egg crate framework defining spaces in the molds;
d. filling the spaces defined by the egg crate framework with a polymeric rigidizing foam;
e. forming a vacuum plenum chamber by
i. attaching a first cap board to said polymeric foam and said crate framework; and
ii. attaching spacers to said first cap board and a second cap board to said spacers, the first and second cap board being of a durable material which remains rigid under vacuum forming conditions;
f. securing to said vacuum plenum chamber a means for introducing a vacuum therein; and
g. forming air passageways through said gel coat, said rigid layer said polymeric rigidizing foam, said cap board and into said vacuum chamber, including forming some of said passageways adjacent portions of said mold corresponding to sharp angles and indentations in the molded product, thereby making said mold.

4,073,050

METHOD OF MAKING FIBEROPTIC CABLE ASSEMBLY

Jacobus Kloots, Sturbridge, Mass., assignor to Applied Fiberoptics, Inc., Southbridge, Mass.

Filed Aug. 31, 1976, Ser. No. 719,342
Int. Cl.[2] B23P *11/02*
U.S. Cl. 29—450 **4 Claims**



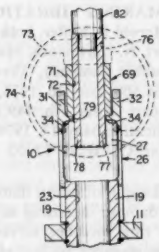
1. A method of assembling fiberoptic cables comprising:
a. cutting a length of extruded elastomer tubing;
b. fitting into one end of said tubing an insert while leaving a portion of said insert exposed;
c. placing said end into a mold and molding an end casing of elastomer around said tubing extending over and adhering to said insert;
d. installing a bundle of optical fibers in said tubing projecting at said one end;
e. securing a cylindrical end fitting into said insert;
f. cutting said fibers at said one end;
g. filling the interstices between said fibers and space between said fibers and said end fitting with cement; and,
h. polishing said fibers flush with said end fitting at said one end.

4,073,051

PISTON PIN INSTALLING AND REMOVING METHOD

James A. Okamuro, Kalamazoo, Mich., assignor to Borroughs Tool & Equipment Corporation, Kalamazoo, Mich.

Division of Ser. No. 698,671, June 22, 1976, Pat. No. 4,050,139.
This application Feb. 22, 1977, Ser. No. 770,454
Int. Cl.[2] B23P *19/02*
U.S. Cl. 29—427 **1 Claim**



1. A method for assembling and disassembling a piston pin connection between a connecting rod and a piston head, said piston head being hollow and having spaced readily deformable walls which each have a first opening therein aligned with the other first opening, wherein said connecting rod has an end having a second opening therein adapted to receive said piston pin therein and wherein a clearance space exists between said end and said spaced walls of said piston head which have said aligned first openings therein, comprising:
supporting said connecting rod in said clearance space in a manner to engage said rod with said wall opposite said clearance space; and
moving said piston pin relative to said connecting rod and said piston head to effect said assembling and disassem-

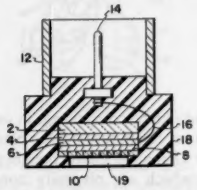
bling of said piston pin connection between said connecting rod and said piston head, the resistance to movement of said piston pin being absorbed by the support for said connecting rod.

4,073,052

METHOD OF MAKING A REFERENCE ELECTRODE

Eugene L. Szonntagh, Flourtown, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 661,958, Feb. 27, 1976, Pat. No. 4,031,606, which is a division of Ser. No. 552,284, Feb. 24, 1975, abandoned.
This application Jan. 19, 1977, Ser. No. 760,542
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—570 3 Claims



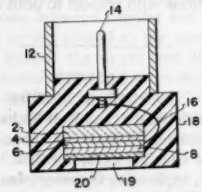
1. A method of making a reference electrode comprising the steps of depositing a metallic layer on an electrically insulating substrate, depositing a solid electrolyte layer on said metallic layer, depositing a glass layer on said electrolyte layer with a coefficient of thermal expansion mismatched with respect to a coefficient of thermal expansion of said electrolyte layer to produce cracking of said glass layer during a predetermined temperature cycle and exposing said electrode to said temperature cycle.

4,073,053

METHOD OF MAKING AN ION RESPONSIVE ELECTRODE

Eugene L. Szonntagh, Flourtown, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 661,958, Feb. 27, 1976, Pat. No. 4,031,606, which is a division of Ser. No. 552,284, Feb. 24, 1975, abandoned.
This application Jan. 19, 1977, Ser. No. 760,584
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—570 4 Claims



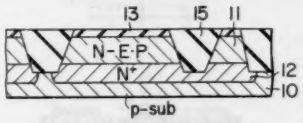
1. A method for making a pH electrode comprising the steps of depositing a metallic layer of an electrically insulating substrate, depositing a solid electrolyte layer on said metallic layer, and depositing a pH glass layer by RF sputtering on said electrolyte layer, said glass layer having a coefficient of thermal expansion substantially matched with respect to a coefficient of thermal expansion of said electrolyte layer to maintain the integrity of said glass layer over a predetermined temperature range.

4,073,054

METHOD OF FABRICATING SEMICONDUCTOR DEVICE

Tadao Kaji, Tokyo, and Yoshio Homma, Hachioji, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 13, 1976, Ser. No. 714,197
Claims priority, application Japan, Aug. 25, 1975, 50-102181
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—580 1 Claim



1. A method of fabricating a bipolar type semiconductor integrated circuit device, comprising the steps of:

(a) selectively forming an embedded N^+-type layer in one major surface of a substrate of P-type silicon;

(b) growing an N-type epitaxial layer all over the surface of said embedded N^+-type layer and said P-type silicon substrate;

(c) selectively etching said N-type epitaxial layer through a mask of suitable material to provide a groove which extends into said N^+-type layer;

(d) depositing an SiO_2layer by chemical vapor deposition to cover said N-type epitaxial layer and to fill said groove;

(e) coating said CVD-SiO_2layer with a layer of PIQ resin;

(f) applying rf sputtering from the side of the surface of said PIQ resin layer to remove by etching said PIQ resin layer and said CVD-SiO_2 layer to leave in said groove a portion of said CVD-SiO_2 layer having a flat surface extending flush with the surface of said mask thereby providing an isolation region;

(g) forming a P-type base region in said N-type epitaxial layer by diffusion;

(h) forming an N^+-type emitter region in said P-type base region by diffusion;

(i) forming an N^+-type collector contact region in the portion of said N-type epitaxial layer external to and spaced apart by said isolation region from the portion of said N-type epitaxial layer in which said P-type base region and said N^+-type emitter region are formed;

(j) depositing electrodes in contact with said N^+-type emitter region, said P-type base region and said N^+-type collector contact region respectively; and

(k) sealing the resultant device with a suitable resin.

4,073,055

METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICES

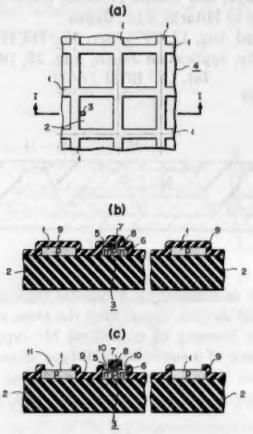
Minoru Kimura, Kawasaki; Hiroyuki Tango, and Yukio Ohmori, both of Yokohama, all of Japan, assignors to The President of the Agency of Industrial Science and Technology, Tokyo, Japan

Filed Feb. 22, 1977, Ser. No. 770,605
Claims priority, application Japan, Feb. 23, 1976, 51-17911
Int. Cl.[2] H01L *21/302*
U.S. Cl. 29—583 10 Claims

1. A method for manufacturing semiconductor devices, comprising the steps of

a. selectively forming first and second semiconductor regions on an insulating substrate, said first semiconductor region constituting a semiconductor element in a later step and said second semiconductor region being formed in a manner to substantially surround a semiconductor chip which is cut away from a semiconductor wafer along its dicing line in a later step;

b. forming said semiconductor element on said first semiconductor region; and



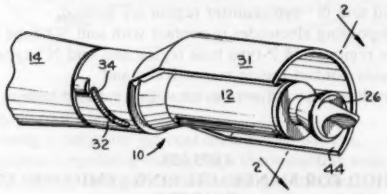
c. cutting said semiconductor chip away from said semiconductor wafer along the dicing line marked on said second region.

4,073,056

VEGETABLE PEELER

Robert L. Schaeffer, LeRoy, and William M. Maher, Churchville, both of N.Y., assignors to General Electric Company, Bridgeport, Conn.

Filed Apr. 11, 1977, Ser. No. 786,651
Int. Cl.² B26B *7/00*
U.S. Cl. 30—123.5 **4 Claims**



1. A vegetable peeler having a handle supporting a cylindrical and electrically rotatable cutter body with a longitudinally removable mounting shaft connected to said handle, a plurality of spaced cutter blades extending longitudinally from the body outer to inner end and a fixed splatter shield partially around and spaced from said body and supported on said handle, a cutter and shield release assembly comprising,

a cylindrical tapered support surface on said handle and a matching tapered support surface on said shield for telescopic locking together,

cam and slot connection means between said surfaces,

a flared inner end on said body, and

abutment means on said shield adjacent said flared end

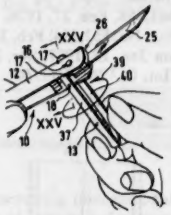
whereby rotation of the shield cams the handle and shield apart to break the tapered connection and simultaneously abuts the body flared end to release the cutter.

4,073,057

FOLDING BLADE KNIFE

Richard Gilbert, Dronfield Sheffield, England, assignor to Stanley Tools Limited, England

Continuation of Ser. No. 713,407, Aug. 11, 1976, abandoned.
This application Apr. 4, 1977, Ser. No. 784,068
Claims priority, application United Kingdom, Aug. 26, 1975, 35245/75
Int. Cl.² B26B *5/00*
U.S. Cl. 30—153 **4 Claims**



1. A folding blade knife comprising, in combination:

a blade and a pivot for mounting the blade;

a first generally U-shaped guard member having arms, the free ends of which are pivotally connectable with the pivoted end of the blade to enable relative pivoting of the blade and said first guard member about a first axis to a first relative position in which the blade is stored between the arms of said first guard member and to a second relative position in which the blade is uncovered by said first guard member;

and a second generally U-shaped guard member having arms, the free ends of which are pivotally connectable with the pivoted end of the blade to enable the relative pivoting of the blade and said second guard member about a second axis which is perpendicular to but non-intersecting with said first axis to a first relative position in which the blade is stored between the arms of said second guard member and to a second relative position in which the blade is uncovered by said second guard member;

one of said guard members having its U-shaped end covered by the other of said guard members when the blade is stored by both guard members and the other of said guard members having its U-shaped end covered by the said one of said members when the blade is uncovered by both guard members;

an intermediate portion of at least one of the arms of one of said guard members projecting inwardly to engage the arms of the other of said guard members to latch the guard members together when the blade is in at least one of its relative positions with respect to both of said guard members.

4,073,058

BARBER SCISSORS

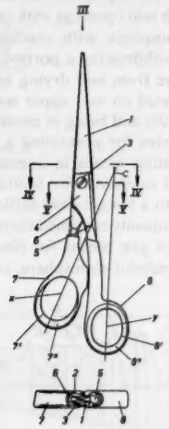
Johannes Solf, Sindelfingen, and Rolf Eicker, Solingen, both of Germany, assignors to H. Eicker & Sohne, Solingen, Germany

Filed Dec. 15, 1976, Ser. No. 750,685
Claims priority, application Germany, Jan. 19, 1976, 2601687; May 29, 1976, 2624280
Int. Cl.² B26B *13/00*
U.S. Cl. 30—257 **18 Claims**

1. In a barber scissors having two halves, each including a blade provided with a tip and a cutting edge, a midsection having a pivot point, and a leg connecting said pivot point to a finger ring, said halves being operably linked at the pivot point by a bolt, the scissors having a central axis through said bolt and the tips in a closed position, the improvement wherein:

said finger rings are coplanar, a first half has a long leg while a second half has a short leg, and said bolt makes an acute

angle ranging between substantially 60° and 80° with the plane of said finger rings,



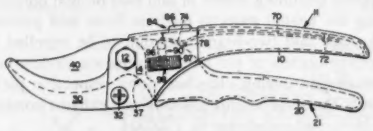
said legs being of different lengths with said finger rings being staggered by a distance of substantially a diameter of one finger ring, the longer leg being curved to cross said axis at an acute angle.

4,073,059

HOOK STYLE PRUNING SHEAR

Edward Morris Wallace, Longmeadow, and Robert George Gosselin, Springfield, both of Mass., assignors to Wallace Mfg. Corporation, Enfield, Conn.

Filed Aug. 30, 1976, Ser. No. 718,827
Int. Cl.[2] B26B *13/16*
U.S. Cl. 30—261 **6 Claims**



1. A pass-by type pruning shear comprising:
a cutting blade,
a holding blade,
a yoke shaped upper handle straddling the blades,
a lower handle unitary with the cutting blade,
interengaging means between handles and blades,
a cantilever type spring pinned to the upper handle at one extremity for biasing the upper and lower handles to opened position, and a power element mounted within and entirely concealed by the geometry of the upper handle in all operating positions and having a bearing relationship with the upper handle and cutting blade and spring for damping the impact of completion of a cutting function.

4,073,060

POTATO SPIRAL CUTTER

Leonard Monroe Hendricks, 1350 E. Main St., Houma, La. 70360

Filed Dec. 3, 1975, Ser. No. 637,476
Int. Cl.[2] B26B *3/04*
U.S. Cl. 30—279 R **1 Claim**

1. A device for cutting long spiral ribbons approximately ¼ inch square from a potato, said device is constructed of steel or similar material and consists of a handle to which are attached a blade, very thin, approximately 3 inches long, ¼ inch wide, parallel to the handle and cutter bars, also thin approximately ¼ inch wide, ¼ inch long, perpendicular to the handle and seperated from each other by a distance of approximately ¼ inch being evenly spaced and placed with one end attached to the handle and the other attached to the blade with the sharp edge facing the same direction as the sharp edge of the blade, a guideing spike attached to the end of the blade and handle,

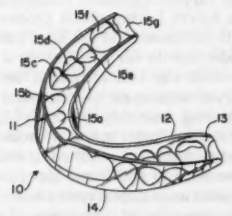
which is opposite the end held in the hand, at an angle approximately 10° from perpendicular and including a driving augar attached to the base of the spike, whereby when said spike is inserted in a potato the potato is pulled into the blade and cutter which will simultaneously disect the potato into ¼ inch spiral ribbons.

4,073,061

CLOSELY ADAPTED ORTHODONTIC APPLIANCE

Earl Olaf Bergersen, 950 Linden Ave, Winnetka, Ill. 60093

Filed June 11, 1976, Ser. No. 695,103
Int. Cl.[2] A61C *7/00*
U.S. Cl. 32—14 B **36 Claims**

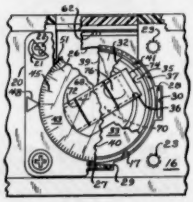


1. An orthodontic appliance of the type which is generally U-shaped in plan view and which includes a tooth receiving trough for at least one of the upper or lower row of a patient's teeth, said trough being formed between a labial-buccal flange and a lingual flange,
said appliance being formed of a material which can be softened and non-elastically reshaped at a softening temperature which is located between 100° and 212° F, and which, below the softening temperature, is relatively hard, stiff and essentially non-resilient,
said appliance, after being reshaped, exactly fitting the teeth of a given patient at least in the area of the occlusal and incisal edges of a row of teeth and from the occlusal or incisal edges thereof to the undercut portion of the clinical crown surfaces of at least some of the teeth of that row,
said material, thus exactly fitting said teeth, being capable of snapping into place onto the said row of teeth to hold the patient's teeth in that position which it exactly fits.

4,073,062
LEVEL

Donald E. Wright, 14265 Juneau Blvd., Elm Grove, Wis. 53122

Continuation of Ser. No. 592,731, July 3, 1975, abandoned. This application Oct. 20, 1976, Ser. No. 734,241
Int. Cl.[2] G01C 9/28
U.S. Cl. 33—388 6 Claims



1. A level comprising:

a frame including elongated and substantially planar working surfaces mounted respectively on opposite sides of said frame and in substantially normal relationship therewith;

a level vial containing bubble indicating means and having bubble registry means adapted to register a level position when the longitudinal axis of the vial is positioned in a pre-selected plane;

selectively adjustable mounting means for rotating freely said level vial relative to said frame for variable, selective angular alignment of the longitudinal axis thereof with respect to the plane of the working surfaces;

said mounting means including inner and outer vial support cylinders, the inner cylinder containing the level vial and said inner cylinder being positioned within the outer cylinder, the outer cylinder being supported on the periphery thereof in an aperture in said frame for rotation about an axis disposed perpendicular to the plane of said frame;

said inner vial support cylinders consisting of two halves, each of the halves having opposed fingers and end slots located on its innermost wall to receive the vial in a close-fitting engagement, the outer wall of each of the halves having plural keys extending therefrom;

said outer vial support cylinders consisting of two halves, each of the halves having plural grooves located on its inner wall to accommodate the keys extending from the inner cylinder halves for establishing a pre-determined orientation with the vial contained between the inner cylinder halves with respect to the outer cylinder halves thereby allowing assembly of the vial, inner cylinder halves, and outer cylinder halves without any requirement of skilled adjustment and calibration; and

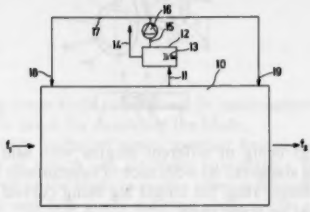
cover plates secured to said frame for restraining the outer cylinder against axial displacement relative to said frame, whereby the pre-selected orientation of said bubble indicating means with said registry means of said level vial indicates a pre-selected angular relationship of the longitudinal vial axis and the working surfaces when the one of the working surfaces is in contact with the surface being measured.

4,073,063
METHOD AND DEVICE FOR DRYING SURFACE TREATED, ESPECIALLY VARNISHED OBJECTS

Rolf Gutjahr, Stuttgart, Germany, assignor to Firma Otto Durr, Stuttgart, Germany

Filed Dec. 8, 1975, Ser. No. 639,003
Claims priority, application Germany, Aug. 19, 1975, 2536935
Int. Cl.[2] F26B 3/02
U.S. Cl. 34—32 5 Claims

1. A device for drying solvent-based coatings on objects, comprising a drying housing having an upper wall, a lower wall and spaced end walls intermediate said upper and lower walls, each of said end walls having openings for permitting objects to be passed through said housing, all of said walls together bounding a drying chamber adapted to contain a gaseous atmosphere for drying solvent-based coatings on objects passing through said openings with concomitant charging of the gaseous atmosphere with contaminant solvent-based vapors; means for withdrawing a portion of the contaminant-entrained atmosphere from said drying housing, including an exhaust conduit located on said upper wall substantially centrally of said end walls and being in communication with said drying chamber; means for generating a heated gaseous medium, including heating means in communication with said exhaust conduit and operative for heating the contaminated withdrawn portion to a temperature sufficient to substantially incinerate the contaminants entrained therein to thereby generate a heated purified gas; means for discharging the heated purified gas to the ambient atmosphere, including a discharge



conduit in communication with said heating means and with the ambient atmosphere; and means for admitting the heated gaseous medium into said drying chamber, including a two-branch conduit having an inlet in communication with said generating means and a pair of outlets in communication with said drying chamber and being located on said upper wall, each outlet of said two-branch conduit being proximately located relative to a respective end wall of said drying housing and being spaced on opposite sides of said exhaust conduit at substantially the same distance from the latter, said admitting means further including means in said two-branch conduit for circulating the heated gaseous medium from said generating means through said two-branch conduit to be expelled from the respective outlets of the latter as separate streams which pass through said drying chamber along respective paths of substantially the same length towards said exhaust conduit.

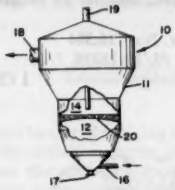
4,073,064
REFRACTORY CONSTRUCTION DOME FOR FLUIDIZED BED REACTOR

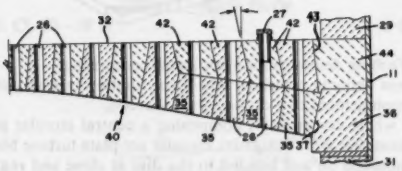
Andrew Beaumont Steever, Old Greenwich, and Richard Ernest Svencer, Norwalk, both of Conn., assignors to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Apr. 12, 1976, Ser. No. 675,858
Int. Cl.[2] F23M 5/02
U.S. Cl. 34—57 A 7 Claims

1. A fluidized bed reactor having a refractory-lined sidewall, a refractory constriction dome comprising a plurality of concentric courses of refractory brick, means supporting said refractory constriction dome in a position dividing the interior of said reactor into a reaction chamber and a windbox, a layer of refractory brick in said constriction dome arranged in the form of a reverse arch dome to resist upwardly directed forces imposed on said constriction dome, a ring of skewback refractory brick imbedded in said reactor sidewall, said skewback refractory brick engaging the outer periphery of said reverse arch dome to support said dome against said upwardly di-

rected forces, said ring of skewback refractory brick having an inner oblique face, opening downwardly and contacting a





mating face provided on the outer periphery of said reverse arch dome.

4,073,065

METHOD AND APPARATUS FOR REDUCING LIQUID CONTENT OF FILTER CAKES

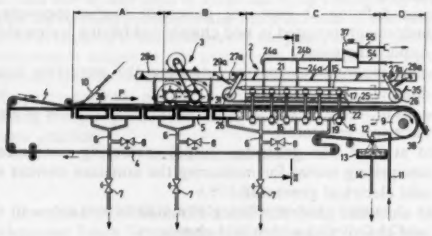
Paul Havalda, Arlesheim, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 7, 1976, Ser. No. 693,393

Claims priority, application Switzerland, June 10, 1975, 7475/75; May 6, 1976, 5690/76

Int. Cl.[2] F26B *19/00*

U.S. Cl. 34—71 **11 Claims**



1. Apparatus for reducing the liquid content in a layer of material formed on a filter comprising a mechanically driven belt filter, drying means comprising at least one vacuum chamber below the filter producing a differential gas pressure across the layer of material having a maximum pressure at the exposed surface of the layer of material and a minimum pressure at the filter, a press having a gas permeable pressure surface and means for forcing said pressure surface against the layer of material on the filter, means for moving the press backwards and forwards above the filter belt parallel to the direction of motion of the filter belt and control means controlling the press whereby in cyclic sequence,

a. the pressure surface is forced against the layer of material on the filter belt,

b. the pressure surface moves in synchronism with the belt for a predetermined distance from a starting position,

c. the pressure surface is disengaged from the layer of material on the filter belt, and

d. the pressure surface returns to said starting position.

4,073,066

METHYLENE CHLORIDE PHOSPHATIZING

Edward A. Rowe, Jr., and William H. Cawley, both of Lake County, Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Division of Ser. No. 560,378, March 20, 1975, Pat. No. 4,008,101. This application June 7, 1976, Ser. No. 693,642

Int. Cl.[2] C23F *7/08*

U.S. Cl. 34—73 **2 Claims**

1. A vapor zone adapted for rinsing and drying phosphate-coated metal that has been in contact with a phosphatizing liquid composition and thereafter comes into contact with said vapor zone, which zone comprises, in the ambient atmosphere of said zone, a mixture of methylene chloride vapor, solubilizing solvent vapor and water vapor, said vapor zone being maintained at a temperature within the range of from about 100° to about 105° F. at normal pressure, and wherein said vapor mixture will provide, on condensation, a homogeneous liquid condensate.

4,073,067

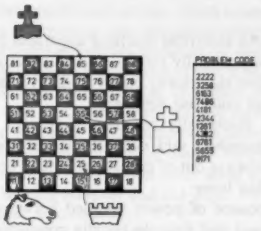
POCKET-SIZE ELECTRONIC DEVICE FOR PLAYING CHESS

Bruce M. Beach, Hornings Mills, Canada

Filed May 9, 1977, Ser. No. 795,177

Int. Cl.[2] A63F *3/00*; G09B *1/00*

U.S. Cl. 35—8 R **2 Claims**



1. A pocket-size portable electronic device for playing chess problems of the type which have a unique definitive solution within a determined number of white and black moves, said electronic device comprising an electronic visual display, a display driver, an 8-digit keyboard and scanner, function keys and scanner, a random access memory, registers and counters, and a logic control unit which includes a switchable data bus controlled by a read only memory, a read only memory pointer and a clock, said device displaying sequentially in digital form the black moves in opposition to the respective sequential entry of correct white moves, said read only memory by way of said logic control unit controlling the sequence of functions of said device in both a load mode and a play mode; in the load mode of said device, coded groups of data are supplied through said keyboard, which are decoded under the control of said read only memory according to an algorithm, and sequentially stored in said random access memory, the decoded groups of digits signifying the white and black moves in solving the chess problem and the sequence in which they are stored in said random access memory determining sequentially the white and black moves for the single solution, said logic control unit causing display of an indication when there is an incorrect entry of a coded group of digits when the conditions of the algorithm are unsatisfied; in the play mode, a group of digits indicating a user's attempted white move are entered through said keyboard, such group of digits having the same number of digits as the number in said stored decoded group of digits corresponding to the correct white move in the sequence, said logic control unit on a positive comparison direct-

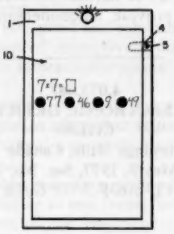
ing the display of the next group of decoded digits in the random access memory signifying the next black move and said logic control unit on a negative comparison causing the display of an indication of an incorrect white move, said logic control unit continuing the comparison of entered white moves with corresponding stored white moves until all of the black moves have been displayed at which point an end of game is displayed.

4,073,068

TEACHING LIGHT

Abraham R. Albenda, 1831 59th St., Brooklyn, N.Y. 11204

Filed June 2, 1977, Ser. No. 802,808
Int. Cl.[2] G09B *7/06*
U.S. Cl. 35—9 B **10 Claims**



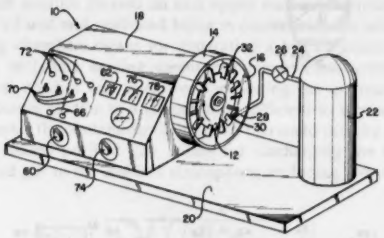
1. An electrical teaching apparatus comprising:
a substantially rigid electrically insulating base member;
a first electrically conducting layer partially covering a face of said base member;
an electrically conducting contact member on said base member, said contact member being spaced from and always out of contact with said first electrically conducting layer;
a source of power coupled between said contact member and said first electrically conducting layer;
an indicator light coupled in series circuit with said power source, said first electrically conducting layer and said contact member;
a question and answer member adapted to overlie said first electrically conducting layer and to engage said contact member, said question and answer member including an electrically insulating bottom layer control sheet which has at least one aperture therein; a second electrically conducting layer on the upper surface of said control sheet and overlying said at least one aperture; an upper electrically insulating question sheet overlying said second electrically conducting layer and having at least one question imprinted thereon and indicia for selecting an answer; said control sheet and question sheet being permanently coupled together at least along an edge thereof in registration with each other and with said at least one aperture in registration with a correct answer indicia, and defining at least one openable flap portion between said control sheet and question sheet, said contact member being passable through said openable flap portion for electrically contacting said second electrically conducting layer;
whereby when pressure is applied in the area of a correct answer indicia, an electrical circuit is completed to said indicator light from said power source, through said contact member and through said first and second electrically conducting layers which contact each other via said pressure in the vicinity of said at least one aperture in said control sheet.

4,073,069

TURBINE DEMONSTRATION

Vahan V. Basmajian, Billerica, Mass., assignor to Megatech Corporation, Billerica, Mass.

Filed Aug. 23, 1976, Ser. No. 716,384
Int. Cl.[2] G09B *25/02;* F01D *15/10;* H02K *7/18*
U.S. Cl. 35—13 **1 Claim**



1. Turbine demonstration apparatus comprising,
means defining a turbine wheel for rotating in response to impingement of a driving fluid thereon,
the wheel construction comprising a central circular plate form disc with elongated, circular arc plate turbine blades mounted on and bonded to the disc at close and regular intervals around the disc periphery,
said blades seating in spaced radial notches of the disc and partially overlapping the disc,
means defining a shallow depth turbine wheel housing, with a transparent cover, for enclosing the turbine wheel,
means defining at least one nozzle extending through the housing for ejecting fluid against the blades, said housing providing a stator reaction mount for the nozzle,
means defining a turbine control instrument chassis mounting an electrical generator and generator load circuit therein with a generator driving shaft extending through a chassis opening,
means for suspending said turbine wheel housing from said chassis and for drivingly coupling said shaft to the turbine wheel,
means defining at least one generator output measuring instrument mounted in said chassis and having a viewable display thereon,
chassis mounted means for adjusting the generator load circuit,
chassis mounted means for adjusting the field current of said electrical generator,
said at least one generator output measuring instrument comprising means for measuring the armature current of said electrical generator,
said electrical generator being mounted from a sidewall of said chassis and within said chassis,
a shaft extension suspended from the shaft of said electrical generator and carrying said wheel to constitute said means for drivingly coupling,
means for generating motive fluid,
and common mounting means for said motive fluid generating means and said turbine control instrument chassis.

4,073,070

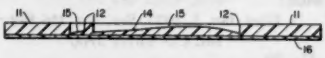
COLORING BOOK FOR THE BLIND

Jacquelin Vaughan Boston, 1101 Palmer Road, Oxon Hill, Md. 20022

Filed Apr. 26, 1977, Ser. No. 790,969
Int. Cl.[2] G09B *11/04*
U.S. Cl. 35—26 **7 Claims**

1. In a coloring book for the blind, a page comprising at least one image thereon having at least one portion to be colored, said image being recessed within the page thereby forming a tactual outline within which the image is to be colored, raised border lines within the outline of the recessed image to tactu-

ally demarcate the respective portions of the image, definitive tactile indicia associated with said images for defining the colors of the respective portions of the images, and coloring



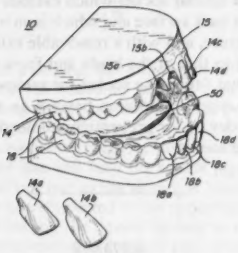
means having identifying tactile indicia thereon corresponding to the definitive tactile indicia whereby a blind person may select the appropriate color the respective portions of the images in accordance with the definitive tactile indicia.

4,073,071

HUMAN MOUTH MODEL FOR SPEECH THERAPY

Norma Angelotti, 24 Trumbull Ave., Haverhill, Mass. 01830

Filed Dec. 30, 1976, Ser. No. 754,445
Int. Cl.[2] G09B *19/04*
U.S. Cl. 35—35 R **3 Claims**



1. A human mouth model having necessary anatomical structure for demonstrating tongue positions to form sound for speech therapy instruction comprising: a transparent upper jaw portion including a hard palate portion, a soft palate portion, gums and a set of upper teeth; a transparent lower jaw portion including a mouth floor, gums, and a set of lower teeth; at least one of said teeth in either set being replaceably removable; an opening formed by the rearward end of said jaw portions in the area of the oral part of the pharynx; a formable and deformable tongue in said mouth and accessible through said opening for manual manipulation; hinge means interconnecting the rearward ends of said jaw portions; said hinge means enabling said jaw portions to swing apart fully to a generally 180° open position.

4,073,072

AIR CIRCULATION SHOE MATERIAL

Alexander Louis Gross, Aspen, Colo., and Erik O. Giese, Key Biscayne, Fla., assignors to Comfort Products, Inc., Aspen, Colo.

Continuation-in-part of Ser. No. 605,999, Aug. 20, 1975, abandoned. This application Aug. 31, 1976, Ser. No. 719,080
Int. Cl.[2] A43B *13/38*
U.S. Cl. 36—44 **9 Claims**

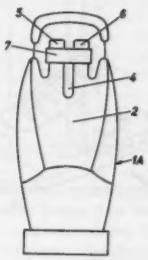
1. An air circulation shoe material comprising a mesh-like plastic first fabric, a mesh-like plastic second fabric spaced from said first fabric, a corrugated plastic separating material extending between and joining said first and second fabrics to form a non-collapsible air space between said fabrics and where said separating material is adapted to resist deformation of said first and second fabrics towards each other to maintain the integrity of the non-collapsible air spaces upon application of a compressive force equal to the body weight of the wearer.

4,073,073

SKIING BOOT

Sigurd Seidel, Graz, Austria, assignor to Skischuhfabrik Dynafit Gesellschaft m.b.H., Graz, Austria

Filed Nov. 15, 1976, Ser. No. 742,061
Int. Cl.[2] A43B *11/00, 21/00, 5/04*
U.S. Cl. 36—50 **4 Claims**



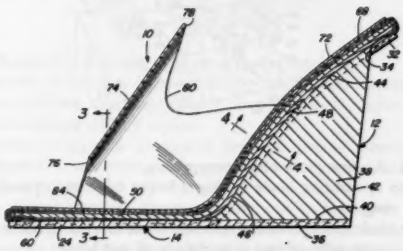
1. A skiing boot comprising an upper having a rear portion that extends upwardly and forwardly and is formed at least at its upper end with a substantially central slot, which is adapted to be closed by means comprising ribs extending along the edges of said slot, and a slider adjustably mounted on said ribs, said slider having a stem extending through said slot, a bearing member carried by said stem and engaging the inside of the upper on both sides of said slot, a clip fitted on said stem and embracing said ribs, and eccentric means adapted to assume an operative position in which said eccentric means forces the bearing member and the clip towards each other so as to grip said ribs between said bearing member and the clip.

4,073,074

LADIES SHOE CONSTRUCTION

Harry H. Rabin, Miami, and Florencio P. Aquino, Hialeah, both of Fla., assignors to Miami Footwear Corporation, Miami, Fla.

Filed Dec. 29, 1976, Ser. No. 755,199
Int. Cl.[2] A43B *13/28;* A43D *9/00*
U.S. Cl. 36—104 **5 Claims**



1. A shoe comprising an outsole, an insole overlying the outsole, an upper secured to the outsole and insole and a heel supporting the rear of the shoe, said outsole including a panel of unitary construction and including a forepart, a shank portion and heel portion, said outsole including a slot formed in the shank and heel portion defined by a tongue forming an extension of the forepart and engaged with the bottom surface

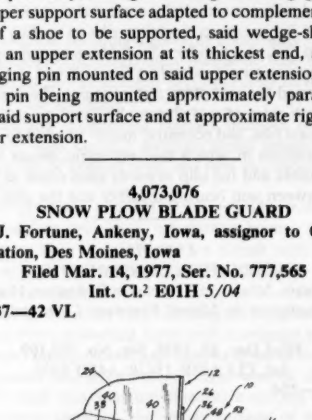
of the heel to complete the bottom construction for the heel, said heel including a heel seat received in the slot and extending substantially throughout the length and width of the slot with the width of the heel being less than the width of the shank and heel portion of the outsole.

4,073,075

GOLF TRAINING DEVICE

John P. O'Brien, 175 E. Delaware Place, Chicago, Ill. 60611

Continuation-in-part of Ser. No. 683,898, May 6, 1976, abandoned. This application Dec. 23, 1976, Ser. No. 753,927
Int. Cl.[2] A63B *69/36;* A43B *5/00*
U.S. Cl. 36—127 8 Claims



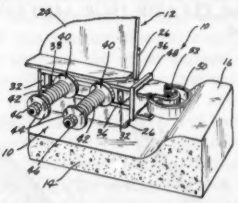
1. A wedge-shaped golf training device adapted to be removably affixed to a shoe, said training device comprising a wedge-shaped body, having a lower, ground engaging surface, and an upper support surface adapted to complement the lower surface of a shoe to be supported, said wedge-shaped body including an upper extension at its thickest end, at least one sole-engaging pin mounted on said upper extension, said sole-engaging pin being mounted approximately parallel to the plane of said support surface and at approximate right angles to said upper extension.

4,073,076

SNOW PLOW BLADE GUARD

William J. Fortune, Ankeny, Iowa, assignor to Great Ideas Corporation, Des Moines, Iowa

Filed Mar. 14, 1977, Ser. No. 777,565
Int. Cl.[2] E01H *5/04*
U.S. Cl. 37—42 VL 10 Claims



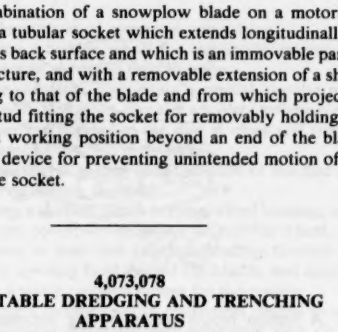
1. A snow plow blade comprising,
an upstanding blade having a lower edge and opposite end edges,
a blade guard connected to said blade extending horizontally outwardly of one of said ends of said blade,
spring means operatively connected between said blade and said guard for allowing said guard to yieldably move horizontally upon engagement with an obstruction outwardly of said one end of said blade, and
said guard including a horizontally extending arm connecting it to a mounting bracket connected to said blade, and said bracket including bolt means with said spring means being mounted thereon operatively engaging said arm.

4,073,077

SNOWPLOW BLADE EXTENSION

Albert E. Essel, deceased, late of Twinsburg, Ohio, and by Virginia G. Essel, executrix, 9310 Ravenna Road, Twinsburg, Ohio 44087

Filed Jan. 3, 1977, Ser. No. 756,148
Int. Cl.[2] E01H *5/00*
U.S. Cl. 37—50 10 Claims



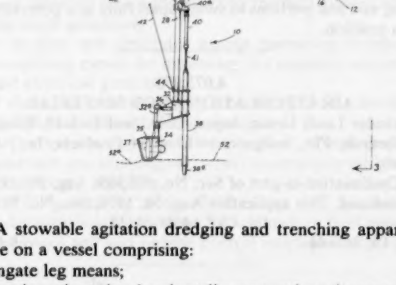
1. The combination of a snowplow blade on a motorized vehicle, with a tubular socket which extends longitudinally of the blade on its back surface and which is an immovable part of the blade structure, and with a removable extension of a shape corresponding to that of the blade and from which projects a longitudinal stud fitting the socket for removably holding the extension in a working position beyond an end of the blade, and a locking device for preventing unintended motion of the stud out of the socket.

4,073,078

ADJUSTABLE DREDGING AND TRENCHING APPARATUS

Julius H. Leitz, 6211 N. Ensign, Portland, Oreg. 97217

Filed Nov. 3, 1975, Ser. No. 628,116
Int. Cl.[2] E02F *3/00*
U.S. Cl. 37—77 24 Claims



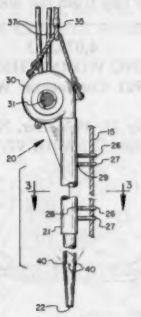
1. A stowable agitation dredging and trenching apparatus for use on a vessel comprising:
elongate leg means;
a housing adapted to be pivotally mounted on the vessel for slidably receiving said leg means, said housing adapted to be swung between a position permitting said leg means to be vertically extended or retracted and a position for substantially horizontally stowing said leg means;
power driven agitation means disposed adjacent to a distal end of said leg means for producing an eroding current of water against the bottom surface of a body of water; and
impeding means mounted on said leg means including a spud foot and means selectively operable for shifting said spud foot relative to said leg means for penetration into the bottom surface.

4,073,079

DEVICE FOR PUMPING OUT SANDED IN CRAB POTS

Nathan I. Klinefelter, Rte. 1, Box 830, Brookings, Oreg. 97415

Filed Nov. 15, 1976, Ser. No. 742,361
Int. Cl.[2] E02F *3/00*
U.S. Cl. 37—78 3 Claims



1. A device for pumping out a crab pot on a sea bottom, which has become embedded by drifting sand as a result of ocean currents along the sea bottom, said crab pot having a pot line extending up to the surface of the water for lifting the crab pot; said device comprising a nozzle pipe having guide means to receive said pot line and hold the nozzle pipe substantially paralled with said pot line as the device is lowered along the pot line, a pickup line connected to the upper end of the device for lowering and raising the device on said pot line, a nozzle opening in the lower end of said nozzle pipe, a hydraulic pump on the upper end of said nozzle pipe having an inlet to receive the sea water and arranged to pump said sea water through said nozzle pipe, a motor mounted on said pump for driving the pump, and power conduits of small size in relation to said nozzle pipe, so as not to be seriously disturbed by said ocean currents, extending from said motor to a source of power above the surface of the water to operate said motor; a jet of water from said nozzle opening washing away enough of said drifted sand to allow the crab pot to be lifted away from the sea bottom by said pot line.

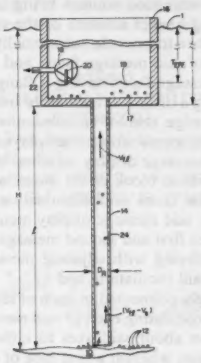
4,073,080

METHOD OF UNDERWATER HYDRAULIC CONVEYING FOR OCEAN MINING AND THE LIKE

Jan-Olaf Willums, Massachusetts Institute of Technology, Bldg. 54-1418, Cambridge, Mass. 02139, and Dieter Hody, Tannstr. 2, 8800 Thalwil, Switzerland

Continuation of Ser. No. 294,304, Oct. 2, 1972, abandoned. This application Apr. 5, 1974, Ser. No. 458,414
Int. Cl.[2] E02F *1/00, 3/88*
U.S. Cl. 37—195 4 Claims

1. A method of lifting fluid and bodies carried therewith from a region below the surface of a free fluid medium, that comprises providing an at least partly gas-filled chamber with an elongated conduit commencing with an outlet to said chamber at a bottom wall of said chamber and then extending away therefrom externally of the chamber, at least partially submerging the chamber in the fluid medium to a depth of the order of hundreds of meters and extending the conduit downwardly from said bottom wall of the order of thousands of meters to said region below the surface of said medium, whereby fluid carrying said bodies tends to move from said region through said conduit into said chamber, leaving said conduit at said bottom wall and rising in said chamber above said outlet, providing a pump in said chamber adjacent to the bottom wall thereof and operating said pump to pump fluid from said chamber into the fluid medium surrounding said chamber and at a rate to maintain the uppermost fluid level in said chamber sufficiently lower than that of the surrounding fluid medium such that the fluid pressure corresponding to the difference between said levels is at least as great as the sum of the frictional pressure drop of fluid through said conduit and the pressure drop due to the lifting of said bodies in the fluid



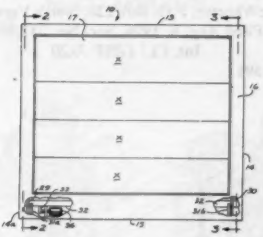
medium through said conduit, maintaining the velocity of fluid flow through said conduit larger than the steady state sinking velocity of said bodies, and maintaining the gas pressure in said chamber low enough to permit the fluid from said conduit to flow into said chamber.

4,073,081

CHANGEABLE MESSAGE SIGN WITH SINGLE MESSAGE DISPLAY OPENING

E. Tait Hunter, Jr., 384 Redwood Drive, Marietta, Ga. 30060

Continuation-in-part of Ser. No. 602,788, Aug. 7, 1975, Pat. No. 3,983,648, which is a continuation-in-part of Ser. No. 399,537, Sept. 21, 1973, Pat. No. 3,919,794. This application Oct. 1, 1976, Ser. No. 728,860
Int. Cl.[2] G09F *11/02*
U.S. Cl. 40—470 5 Claims



1. Changeable message, sign apparatus comprising:

a housing defining a message display region and having a face defining a message display opening which is open to said message display region;

an array of separate elongated message display members disposed in said message support region for oscillation on respective parallel coplanar axes;

each of said message display members including a pair of illumination-transmissive message faces to form a message member having an open side, and additionally including separate end members attached to said message faces at opposite ends thereof;

each of said message display members being supported for oscillation in said message display region by pivot means which extend from said housing to said end members but which does not extend within said message member;

a separate source of illumination fixedly mounted within said housing behind and within said open side of each of said

open message display members so that said message faces are back-lighted;

each of said illumination sources being elongated and disposed in substantially parallel alignment with the axis of rotation of a corresponding said message display member;

each of said illumination sources being located behind the corresponding axis of rotation of the respective message display member to provide substantially uniform internal illumination of said message faces; and

each of said message faces having a flanged extension portion extending a distance rearwardly from an unsupported longitudinal edge thereof in substantially parallel alignment with the confronting undisplayed message face of the adjacent message display member, so that said flanged extension portions block direct illumination which would otherwise pass from said illumination sources through gaps between said message display members during oscillation between first and second message display positions, without interfering with adjacent message display members during said oscillation; and

means operatively connected to each of said message display members for oscillating each of said message display members in unison about said axes to either a first message display position, whereat a first face of each said message member is aligned in said message display opening, or to a second message display position, whereat a second face of each said message member is aligned in said message display opening;

each of said message faces including said flanged extension portion comprises a unitary member which is connected between said separate end members of said message display members, whereby said flanged extensions provide enhanced torsional stiffness for each message member;

each said elongated illumination source is longer than the corresponding message display member; and

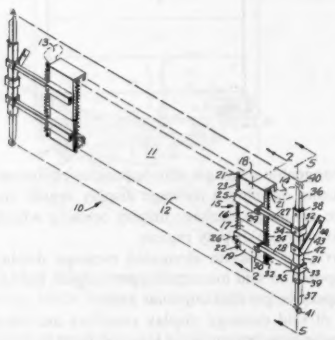
each of said end members of said message display members has a pair of recesses which accommodate said illumination source without interference as said message display member oscillate.

4,073,082

TRUCK BUMPER ATTACHMENT

Delmer L. McWhorter, P.O. Box 220, North Vernon, Ind. 47265

Filed Aug. 6, 1976, Ser. No. 712,050
Int. Cl.[2] G09F *7/20*
U.S. Cl. 40—591 **1 Claim**



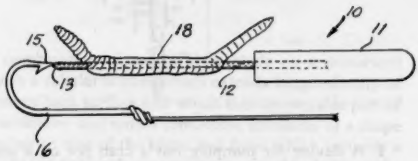
1. An attachment for truck bumpers to hold wide-load signs comprising "C" shaped clamp means for fastening the attachment to the bumper having cushion material on its innerface to prevent marring, hooks for securing the sign, means for adjusting the hooks according to the horizontal measurement of the sign, and means for adjusting the hooks according to the vertical measurement of the sign, said means for fastening the attachment to the bumper includes a pair of spring urged members for encircling the bumper; said horizontal adjustment includes a pair of hollow channels mounted on the attachment, a movable plunger in each channel and screws for fastening the plungers to the channels; said vertical adjustment includes another hollow channel mounted on the outer ends of the pair of plungers, hooks movable out of the top and bottom ends of the other channel, and screws for securing the hooks to the channel; and a short arm attached to said other channel for supporting a separate flag from the wide-load sign.

4,073,083

FISHING WORM THREADER

Chester B. Davis, 3921 Continental Way, Carmichael, Calif. 95608

Filed July 21, 1976, Ser. No. 707,344
Int. Cl.[2] A01K *97/00*
U.S. Cl. 43—4 **1 Claim**



1. A fish hook bait threader comprising a generally cylindrical handle, an elongate hollow needle having one end secured to said handle and the opposite end extending axially outwardly therefrom, and a socket formed in the outer end of said needle to receive the part of a fish hook to permit bait threaded on said needle to be transferred to the fish hook.

4,073,084

ARTIFICIAL BAIT FOR FISHING

Sergio Favron, Milan, Italy, assignor to Giancarlo de Taddeo, Milan, Italy

Filed Apr. 14, 1976, Ser. No. 676,709
Claims priority, application Italy, Apr. 23, 1975, 21300
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.35 **9 Claims**

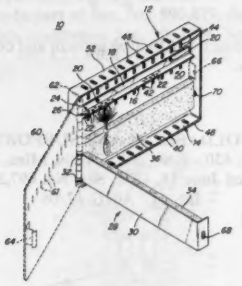
1. An artificial bait comprising: two half-shells joined to each other; an interior separating wall forming two separate chambers with the interior walls of said half-shells; transverse projection means in one of said chambers; a ballast weight member with recesses receiving said projection means, said projection means holding said weight member in clamped position in said one chamber when inserted into said recesses, said ballast weight member being insertable into said one chamber and engaging clampingly said projection means for applying to said chamber ballast weight, said weight member being variable in weight dependent on the length of said weight member; a longitudinal rod-shaped element embedded along its length in a portion of one of said half-shells and having ends projecting to the exterior of said one half-shell from the ends of a longitudinal axis through said one half-shell, said ends of said rod-shaped element being substantially ring-shaped, one of said ring-shaped ends being connectable to fish

hook means and the other ring-shaped end being connectable to control fishing-line means.

4,073,085
FISH LURE BOX

Victor Robert Stremeckus, 5 S. Waverly St., Brighton, Mass. 02135

Filed Apr. 2, 1976, Ser. No. 673,191
Int. Cl.[2] A01K *97/06*
U.S. Cl. 43—54.5 R **6 Claims**

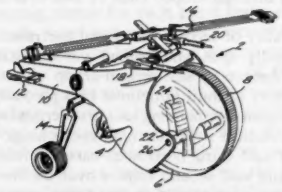


1. A fish lure box comprising: a base including a compartment; an elongate hook rack mounted to said compartment and having a multiplicity of holes for receiving fish hooks; a cover for said compartment; first latch means for releasably securing said cover to said compartment; a clamp assembly intermediate said cover and said compartment and including an elongate clamp arm laterally spaced from said rack; first hinge means for swingably interconnecting said cover and said compartment; said hinge means for swingably interconnecting said clamp arm with said compartment between said compartment and said cover; said first and second hinge means being disposed along an edge of said compartment transverse to the longitudinal axis of said elongate hook rack; a first narrow, elongate resilient member attached to said compartment adjacent said clamp arm, and a second narrow elongate resilient member attached to said clamp arm in juxtaposition to said first resilient member; second latch means for securing said clamp arm to said compartment with said resilient members in close juxtaposition for gently, firmly holding a portion of the bodies of fish lures whose hooks engage said hook rack.

4,073,086
VEHICLE TOY

Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

Filed June 9, 1976, Ser. No. 694,134
Int. Cl.[2] A63H *23/10, 27/12*
U.S. Cl. 46—91 **23 Claims**



1. A helicopter toy comprising;
a fuselage member having a first longitudinal axis;
a cockpit member connected to one end of the fuselage member;
a helicopter blade mounted on the fuselage member for relatively movement;
means for rotatively connecting the cockpit member to the fuselage whereby the cockpit member can rotate relative to the fuselage member about a second axis, and
transmission means for interconnecting the rotation of the cockpit member with the helicopter blade.

4,073,087
TOY VEHICLE HAVING PARACHUTE ATTACHED THERETO

Michael E. Ieda, Fort Solanga, N.Y., assignor to Ideal Toy Corporation, Hollis, N.Y.

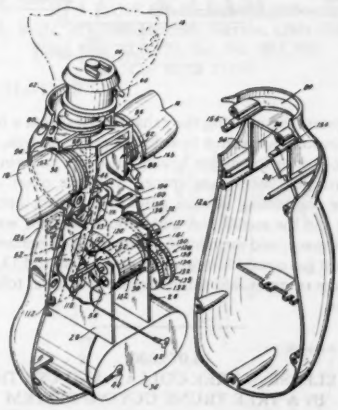
Filed Jan. 30, 1976, Ser. No. 653,975
Int. Cl.[2] A63H *29/20, 17/42*
U.S. Cl. 46—202 **19 Claims**

1. A toy vehicle adapted to move along a surface comprising, a vehicle body and a plurality of wheels rotatably mounted thereon, said vehicle body including means for receiving and containing a simulated parachute therein, and means for selectively ejecting a simulated parachute in said receiving means, and means for sensing when said vehicle has passed through a predetermined sequence of different relative positions with respect to the surface along which it is moving during movement along its path of travel and for actuating said ejecting means after said vehicle has passed through said sequence of different relative positions.

4,073,088
TOY DOLL

Janos Beny, Redendo Beach; John W. Ryan, Los Angeles, both of Calif., and Edward Snyder, III, Dix Hills, N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.

Filed Dec. 6, 1976, Ser. No. 747,741
Int. Cl.[2] A63H *33/26*
U.S. Cl. 46—265 **47 Claims**



30. A toy doll comprising a body, a head, means in said body for mounting the head on the body for fore and aft rocking movement and side to side rotating movement; a pair of arms respectively having opposed hand and shoulder end portions, a frame rotatably mounted in said body adjacent the shoulders of the body for rotation along a first axis extending between said shoulders transversely of the body and pivot means for rotatably mounting the shoulder portions of said arms on said frame

for pivotal movement about second axes extending transversely of said first axis whereby the arms will rotate simultaneously with said frame about said first axis and can rotate independently about said second axes; a drive motor in said body and transmission means operatively connected between said motor and said head and frame for:

i. oscillating said frame between first and second extreme positions about said first axis according to a predetermined pattern selected to move said arms from a first position, corresponding to the first position of the frame, wherein said hands are spaced apart at about the level of the shoulders of the body, to a second position wherein the hands are spaced apart at about the level of the doll's midriff, thence to a third position wherein the hands are adjacent each other at about the level of the doll's midriff and thence back to said first position; and

ii. for rotating said head from a front facing position to a side facing position, as said arms move from their first to their second position and thereafter returning the head to its front facing position;

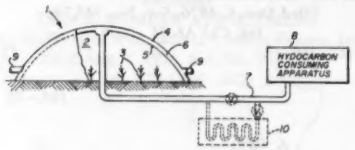
whereby when the doll is placed on a flat surface on its midriff with its hands on the surface and its arms in said first position supporting the shoulders of the doll off of the surface movement of said arms from their first to their third positions and rotation of the head to the side facing position will cause the center of gravity of the doll to shift, thereby tipping the doll over on its back in a direction opposite to the direction in which the doll's head faces in said side facing position.

4,073,089

UTILIZATION OF EXHAUST GASES FOR PLANT GROWTH

Edward A. Maginnes; Eyrle E. Brooks; Maynard O. Haukeness, and George H. Green, all of Saskatoon, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Sept. 27, 1976, Ser. No. 726,582
Int. Cl.[2] A01G *9/00*
U.S. Cl. 47—17 **6 Claims**



1. A system for utilizing the exhaust gases from a hydrocarbon combusting apparatus to enhance plant growth, comprising an enclosure for plants having an outer covering and an inner permeable membrane spaced from the outer covering, means for conducting exhaust gases to the space between the covering and the membrane, and outlet means for waste gases from said space, said membrane having a lower permeability to the exhaust gas component toxic to plants than to CO_2, limiting the passage of gases into the enclosure to a level tolerated by the plants.

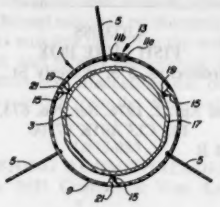
4,073,090

SELF-RELEASING TREE COLLAR AND USE THEREOF IN A TREE TRUNK GUYING SYSTEM

Angelo Peter Lucia, Kent, Ohio, assignor to Tree Guying Systems, Inc., Kent, Ohio

Filed June 28, 1976, Ser. No. 700,502
Int. Cl.[2] A01G *17/04*
U.S. Cl. 47—43 **15 Claims**

1. A collar capable of closure to a substantially circular form around a tree trunk, in the closed state comprising a strip having at least three inwardly projecting lugs, all of said lugs being substantially, uniformly spaced apart about said collar and being more yieldable than the tree trunk, said collar having means holding said strip in a closed state and for disengagement from said tree trunk by tree growth and concomitant tree trunk expansion.

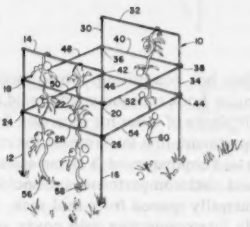


4,073,091

FOLDABLE PLANT SUPPORT

James P. Vogel, 430 - 6 St., SW., Wells, Minn. 56097

Filed June 18, 1976, Ser. No. 697,393
Int. Cl.[2] A01G *17/06*
U.S. Cl. 47—45 **1 Claim**



1. A foldable plant support comprising

(a) a first frame consisting of a pair of opposed first vertical stakes joined at the top thereof by a first connecting bar transverse to said first vertical stakes, a plurality of horizontally opposed first crimp support means extending into lateral walls transversely from the longitudinal axis of said first vertical stakes;

(b) a second frame consisting of a pair of opposed second vertical stakes joined at the top thereof by a second connecting bar transverse to said second vertical stakes, a plurality of second horizontally opposed crimp support means extending into lateral walls transversely from the longitudinal axis of said second vertical stakes matching said first horizontally opposed support means on said first frame, said first horizontally opposed support means on said first vertical stakes being horizontally opposed to said second horizontally opposed support means on said second frame;

(c) a plurality of first horizontal bar means attached to horizontally span said first vertical stakes and supported thereon through looped ends by said first crimp support means;

(d) a plurality of second horizontal bar means attached to horizontally span said second vertical stakes and supported thereon by said second crimp support means;

(e) a plurality of third horizontal bars pivotally attached to and horizontally spanning said first vertical stakes and said second vertical stakes through eyelet hinge means on the ends of said third horizontal bars for folding said first frame and said second frames over on one another, the opening in each of said eyelets being greater in diameter than the diameter of the vertical stakes around which it is positioned and said lateral walls are equal to or greater in length than the diameter of said eyelets, said openings in said eyelets also being great enough to take up the slack created where said first vertical stakes and said second

vertical stakes are folded over on one another so that said plant support will be substantially flat when so folded, said third horizontal bars being supported on said first vertical stakes and said second vertical stakes by said first support means and said second support means.

4,073,092

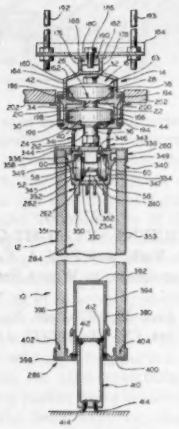
LOST MOTION SUSPENSION SYSTEM FOR OPERABLE PARTITIONS

Charles E. Williams, Delavan, Wis., assignor to Hough Manufacturing Corporation, Janesville, Wis.

Continuation-in-part of Ser. No. 590,879, June 27, 1975, abandoned. This application Jan. 19, 1976, Ser. No. 650,125

Int. Cl.[2] E05D *15/26, 13/02*

U.S. Cl. 49—127 12 Claims



1. In an operable panel type partition arrangement including a plurality of discrete panels, an overhead track defining the path of movement of the panels, and a pair of spaced apart carriers supporting each panel and riding on the track to suspend the respective panels for movement along the track, the improvement wherein:

said panels each define a trackway extending along the width dimension of same adjacent the upper end of same,

said carriers of each panel each having a roller device riding on the respective panel trackways for supporting the respective panels from the track,

means for tandem connecting together the carriers of the respective panels to comprise a carrier assembly for the respective panels,

said carrier assemblies being discrete from each other,

and means for resiliently connecting the carrier assembly of each panel to their respective panels for lost motion movement in either direction longitudinally of the respective panel trackways,

said connecting means for each panel being connected between such panel and said carrier assembly thereof to resiliently oppose said lost motion movement for transmitting forward movement momentum of the individual panels on being pushed forwardly for movement in their planes along the track into forward movement of the respective panel carrier assemblies along the track,

whereby manual pushing of the individual panels to move same in their planes forwardly along the track effects, through said lost motion movement, shifting of the center of gravity of the individual panels forwardly of the direction of movement for transfer to the panel leading carrier of additional weight to be supported by the panel leading carrier, and the carrier assembly thereof is biased for movement along the track in the direction of such panel movement, through said connecting means.

4,073,093

SOUNDPROOF DOOR

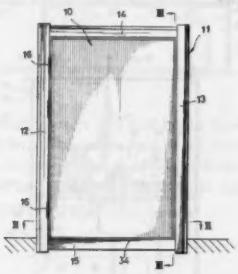
Taro Ookawa, Tokyo, and Shuichi Takeda, Ichikawa, both of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Aug. 17, 1976, Ser. No. 715,111

Claims priority, application Japan, Aug. 18, 1975, 50-113573[U]

Int. Cl.[2] E06B *7/16*

U.S. Cl. 49—381 5 Claims



1. In a sound-insulating door construction adapted to be mounted for pivoting about a vertical axis in a doorway having a bottom surface, the combination comprising:

a. means defining a downwardly facing channel extending along the width of the door in its lower edge;

b. an elongated roller supported on the door in said channel and projecting therefrom for rolling engagement with said bottom surface, said roller being spaced along its length from said channel-defining means; and

c. an elongated sound-insulating screen disposed in said channel and secured to said door, and tangentially engaging said roller along its length for obstructing the passage of sound between said roller and said channel-defining means.

4,073,094

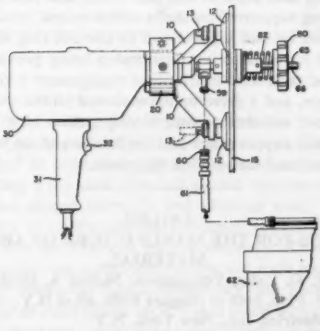
METHOD AND APPARATUS FOR REPAIRING A CRACK IN A PANE OF PLATE GLASS

Robert A. Walz, 217 Enfield Road, Dayton, Ohio 45459

Filed May 31, 1977, Ser. No. 802,246

Int. Cl.[2] B32B *35/00*

U.S. Cl. 51—111 R 8 Claims



1. Apparatus for repairing a crack in a pane of plate glass having a pilot hole therethrough comprising a single drive motor having an extended shaft, an inner cutter, an outer cutter, means for mounting said cutters on said shaft on opposite sides of said pane of glass, and means for yieldably urging said cutters into cutting relation with said pane of glass to

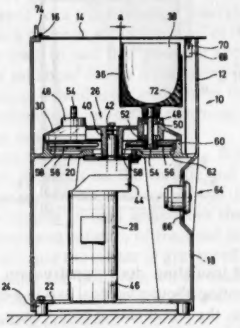
concurrently cut a section therefrom from opposite sides thereof.

4,073,095

CENTRIFUGAL DRUM POLISHING MACHINE

Manfrid Dreher, Haupstr. 74, 7543 Engelsbrand, Germany

Filed Jan. 17, 1977, Ser. No. 759,839
Claims priority, application Germany, Jan. 21, 1976, 2602055
Int. Cl.[2] B24B *31/04*
U.S. Cl. 51—164 **5 Claims**



1. A centrifugal drum polishing machine for simultaneous surface treatment of small parts, such as grinding and polishing by use of a treatment medium, comprising a stationary support, a rotor mounted on said stationary support for rotation around a vertical axis, and a plurality of drum containers of pot-like configuration which are adapted to be closed by covers and to contain the small parts and treatment medium, said drum containers being mounted on said rotor with their axes in vertical positions at the same radial distance from the axis of rotation of said rotor, each drum container being mounted for rotation about its own axis, said support having a running surface arranged coaxially to the axis of said rotor, and said drum containers being in a friction-drive relationship with said running surface for the purpose of rotating the drum containers in response to rotation of said rotor, said support having a contact ring encircling said axes and said running surface being the inside circumferential surface thereof, said rotor having the shape of an inverted dish with its outer periphery overlying said contact ring in close relationship so that an enclosure is provided by said support and said rotor, and said drum containers being supported on shafts which extend into the enclosure defined by said support and its contact ring and by said rotor, said frictional drive relationship being provided by an impeller on each shaft in frictional engagement with said running surface, and a drive motor mounted on the underside of said support, said drive motor having a drive shaft extending through said support into said enclosure and on which said rotor is mounted for rotation therewith.

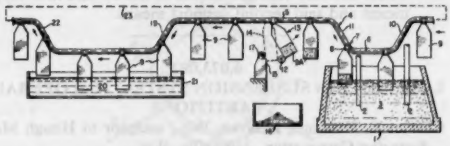
4,073,096

PROCESS FOR THE MANUFACTURE OF ABRASIVE MATERIAL

Herbert F. G. Ueltz, Youngstown; Melvin A. Dashineau, and James J. Pino, both of Niagara Falls, all of N.Y., assignors to U.S. Industries, Inc., New York, N.Y.

Filed Dec. 1, 1975, Ser. No. 636,403
Int. Cl.[2] C09C *1/68*
U.S. Cl. 51—309 A **26 Claims**

1. A process for manufacturing abrasive material comprising
a) melting an abrasive mix in a furnace,
b) removably dipping a relatively cool object in the melted mix in the furnace for a controlled period of time whereby a portion of the mix solidifies on the object as abrasive material,



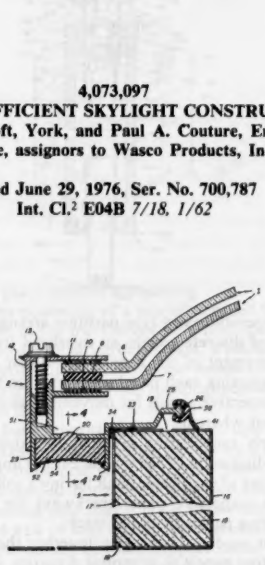
c) withdrawing the entire object and solidified abrasive material from the melted mix, and
d) removing the solidified abrasive material from the object.

4,073,097

ENERGY EFFICIENT SKYLIGHT CONSTRUCTION

Arthur P. Jentoft, York, and Paul A. Couture, Emery Mills, both of Maine, assignors to Wasco Products, Inc., Sanford, Maine

Filed June 29, 1976, Ser. No. 700,787
Int. Cl.[2] E04B *7/18, 1/62*
U.S. Cl. 52—22 **22 Claims**



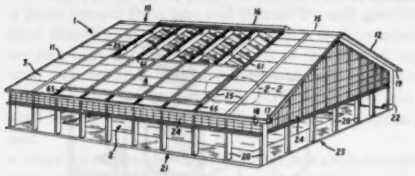
1. In a skylight construction having a skylight cover secured to an annular curb assembly,
said curb assembly including an annular heat insulating core having top, bottom and side wall surfaces,
inner and outer fire shields comprising sheet means covering respectively the inner and outer side wall surfaces of said core,
said inner and outer fire shields extending collectively about the core a distance less than the peripheral distance about the top, bottom and side wall surfaces of the core to thereby define a pair of gaps between ends of the shields for heat insulating the shields from each other,
a frame means for supporting the skylight cover over the curb assembly including flange means cooperating with the curb assembly and support means at one end of the frame means for receiving and at least in part securing an edge of the skylight cover,
said flange means resting upon the top surface of the curb assembly and having thermal conductive contact with only the outer shield.

4,073,098

ROOFING SYSTEM FOR LARGE-AREA BUILDING STRUCTURES

William H. Baker, Rock Hill, S.C., assignor to Paddock Industries, Inc., Boynton Beach, Fla.

Continuation of Ser. No. 390,157, Aug. 20, 1973, abandoned, which is a continuation-in-part of Ser. No. 555,751, March 6, 1975, abandoned. This application Nov. 3, 1975, Ser. No. 627,994
The portion of the term of this patent subsequent to Nov. 27, 1990, has been disclaimed.
Int. Cl.[2] E04C *2/42;* E04B *1/36*
U.S. Cl. 52—66 8 Claims



1. A large-interior-area building roof structure, comprising, in combination, a plurality of beam supports extending in an array approximately in parallel from one side to the other of the building structure, the beam supports comprising a box beam body having on one side thereof a pair of flanged lugs which extend in parallel longitudinally of the box beam, and have slots therethrough for the ends of load-supporting purlins, and an interlocking modular purlin network supported thereon, the network comprising a plurality of load-supporting I-beam purlins extending in an array approximately in parallel in one direction between the beam supports, and a plurality of I-beam purlin spacers extending in an array approximately in parallel between the load-supporting purlins, the purlin spacers being interlocked with the load-supporting purlins, and the ends of load-supporting purlins being interlocked in the slots of the flanged lugs of the beam supports, thereby locking the purlin network to the box beam roof supports; and roofing skins attached on at least one side of the purlin network.

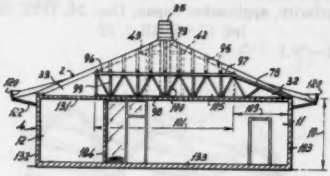
4,073,099

ROOFING OF BUILDINGS

Cornelis van der Lely, 7, Bruschenrain, Zug, and Hendricus Jacobus Cornelis Nieuwenhoven, Hirssattelweg, 6340 Baar, both of Switzerland

Continuation of Ser. No. 545,739, Jan. 30, 1975, abandoned, which is a continuation of Ser. No. 339,366, March 8, 1973, abandoned. This application Feb. 11, 1976, Ser. No. 657,053
Claims priority, application Netherlands, Mar. 10, 1972, 7203175
Int. Cl.[2] E04B *7/16*
U.S. Cl. 52—69 26 Claims

1. A building comprised of a plurality of prefabricated space-bounding sections and a roof spaced over the top of the sections, at least two pairs of roof support members for said roof connected to the top of at least one said section which is elongated and is provided with two longer sides, said pairs of support members being spaced apart, said roof support members in each said pair each being coupled with an opposite one of said longer sides and selectively movable from a substantially horizontal position on the top of said one section to the substantially upright position they occupy supporting said roof in the completed building whereby said one section is adapted to be transported to the building site with said roof support members in said substantially horizontal position, each said roof support member including a supporting beam and connection means at one end of said supporting beam, said connection means including pivot means connected to a first location on top of said one section for pivoting said roof support member from said substantially horizontal position for transport purposes to said substantially upright position it occupies in the completed building, the axis of said pivot means being horizontal and perpendicular to the longer side of said elongated section, said connection means further including securing means connected at least in part to a second location spaced from said first location adapted for rigidly securing said roof support member in said latter position, the other ends of each



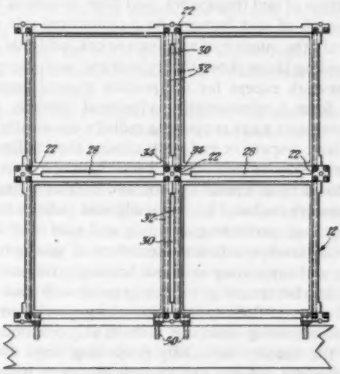
said supporting beam in each said pair being rigidly connected together with a horizontal transverse beam, each said pair of supporting beams being pivoted in opposite directions from the other of said pair and from said horizontal position to said upright position towards each other.

4,073,100

MAUSOLEUM AND METHOD OF CONSTRUCTION

Francis J. DiGiovanni, Jr., 105 Paradise Harbor, Apt. 508, North Palm Beach, Fla. 33408

Filed July 21, 1976, Ser. No. 707,312
Int. Cl.[2] E04H *13/00*
U.S. Cl. 52—79.3 4 Claims



1. An improved mausoleum comprising:

a plurality of rectangular, hollow receptacles stacked upon and adjacent each other to form an array of receptacles disposed in rows and columns, each of said receptacles including a top wall, first and second opposite end faces, first and second sidewalls, and a bottom wall;

a plurality of reinforcing rods disposed substantially vertically near the first and second sidewalls of each of said receptacles and embedded therein and each rod end protruding outwardly from each end face from each sidewall;

a plurality of rigid plates, each of said plates having a plurality of apertures, each plate being attachable to different reinforcing rod ends of different adjacent receptacles; and

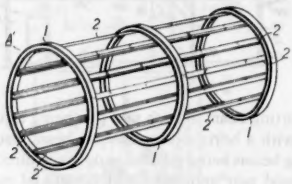
connecting means for attaching said plates to said protruding reinforcing ends whereby the corners of each of said adjacent receptacles are connected together by different plates, each plate resisting the shear force on the receptacle array.

4,073,101

UNIT AND COMBINED HOUSING STRUCTURES

Noboru Yoshida, No. 2-18, Shinonome-cho, Yamatotakada, Nara, Japan

Continuation of Ser. No. 529,011, Dec. 2, 1974, abandoned. This application June 21, 1976, Ser. No. 697,830
Claims priority, application Japan, Dec. 24, 1973, 48-2092
Int. Cl.[2] E04B *1/32*
U.S. Cl. 52—79.1 **7 Claims**



1. A unit housing structure, for stationary on-site installation, comprising, in combination, plural circular rings arranged in axially spaced coaxial relation along a substantially horizontal axis; a plurality of elongated reinforcing bars extending parallel to such substantially horizontal axis and joined to the inner peripheral surfaces of all said rings at circumferentially spaced points therealong to form, with said rings, a horizontally oriented, axially elongated cylindrical framework; a horizontal floor extending chordally of said framework and supported on a pair of longitudinally extending angularly spaced reinforcing bars secured to the inner peripheries of said rings adjacent the lower portion of said framework, said floor extending throughout the length of said framework; a cylindrical side and roof wall on only the interior of said framework, said side and roof wall extending throughout the cylindrical inner periphery of said framework except for the portion thereof beneath said floor, to form a substantially cylindrical laterally enclosed body having said rings projecting radially outwardly from its outer surface; respective end walls closing the axially opposite ends of said body; at least one end wall having a door opening therein closed by an openable door; and interior fittings within said framework enclosed by said walls; said radially outwardly projecting rings protecting said side and roof wall from impacts during transportation and erection of said unit housing structure, and supporting said unit housing structure, with its axis oriented horizontally, on the ground with said side and roof wall and said floor spaced from the ground, and supporting said unit housing structure, with its axis oriented horizontally, on the radially outwardly projecting rings of adjacent said horizontally oriented unit housing structures with said side and roof wall spaced from the side and roof walls of said adjacent unit housing structures.

4,073,102

PREMANUFACTURED MODULAR TOWN HOUSE BUILDING CONSTRUCTION

John Sergio Fisher, 2102 Euclid Ave., Syracuse, N.Y. 13224

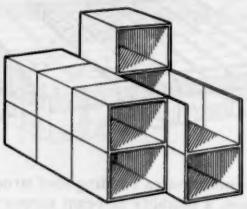
Filed May 29, 1973, Ser. No. 364,808
Int. Cl.[2] E04B *1/34*
U.S. Cl. 52—79.13 **5 Claims**

1. A building unit of the kind having more than one level and constructed in the field from modules which are preformed and prefinished in a factory, said building unit comprising,

a plurality of lower level rectangular modules which and U-shaped in vertical cross-section, and are in longitudinal alignment, each said U-shaped module being the full width of the building unit and having two load bearing sidewalls laterally spaced apart at opposite sides of the building unit and extending along at least a part of the length of the building unit, said U-shaped module also having a floor connected to the lower edges of the sidewalls and having an open top,

a plurality of upper level rectangular modules which are tube-shaped in vertical cross section and are in longitudinal alignment, positioned on the top of an uppermost U-shaped module, said tube-shaped module having two load bearing sidewalls vertically aligned with the U-shaped module sidewalls and having a floor connected to the lower edges of the sidewalls and a ceiling connected to the upper edges of the sidewalls,

horizontal connecting means connecting the adjacent ends of the U-shaped modules together and also connecting the adjacent ends of the tube-shaped modules together,



said horizontal connection means including a recess extending longitudinally along the outer upper edge of each longitudinally aligned sidewall, a reinforcing bar disposed in said excess and extending along the entire length of longitudinally aligned modules and grout connecting the reinforcing bar to each longitudinally aligned module sidewall, and

vertical connecting means connecting all vertically aligned and adjacent modules together whereby the living unit has no double floors or ceilings,

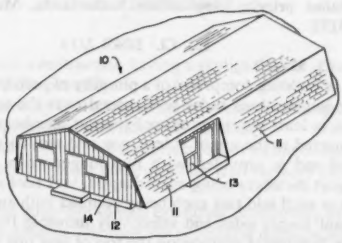
each of said load bearing sidewalls abutting at its lower edge directly upon the upper edge of the adjacent lower sidewall.

4,073,103

BUILDING STRUCTURE AND METHOD OF CONSTRUCTION

Charles Michael McClure, P.O. Box 11165, Tahoe Paradise, Calif. 95705

Filed June 1, 1976, Ser. No. 691,362
Int. Cl.[2] E04B *7/12*
U.S. Cl. 52—93 **15 Claims**



14. A building structure including:

a. a first plurality of prefabricated joist trusses each comprising a joist member of given common length, a first pair of elongated wall members of given common length each extending normally to said length of said joist members and each having one end rigidly fixed to said joist member at a point spaced a given common distance from a different end of said joist member, and a second pair of elongated wall members each extending only between the free end of a different one of said first pair of elongated wall

members and the free end of said joist member adjacent thereto and being rigidly fixed at its ends to said first elongated wall member and said joist member respectively; and

b. a second plurality of prefabricated joist trusses each comprising a short joist member having a length less than the length of said joist members of said first plurality of prefabricated joist trusses by said given common distance, a first elongated wall member having a length equal to said given common length of said first pair of elongated wall members of said first plurality of joist trusses extending normally to the length of said short joist member and having one end rigidly fixed to said short joist member at a point spaced from one end thereof by said given common distance, and a second elongated wall member extending only between the free end of said first elongated wall member and said one end of said short joist member with the opposite ends thereof rigidly fixed to said first wall member and said short joist member respectively; and

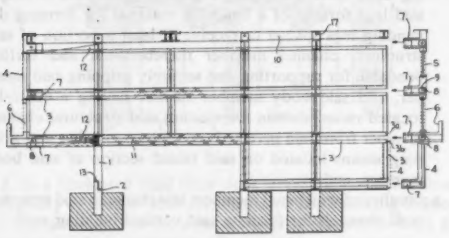
c. a plurality of prefabricated gable trusses each overlying a different one of said joist trusses of said first and second plurality of joist trusses with the free ends of said elongated wall members of said joist trusses rigidly fixed to the adjacent ends of the one of said gable trusses associated therewith.

4,073,104

BUILDING CONSTRUCTION SYSTEM

Gerrit M. Bolanz, Basler Str. 59, D-7858 Weil-Otterbach, Germany

Filed Apr. 8, 1975, Ser. No. 566,059
Claims priority, application Germany, Apr. 19, 1974, 2418824
Int. Cl.[2] E04G *21/00;* **E04B** *1/00, 1/74*
U.S. Cl. 52—125 **17 Claims**



1. A building construction system comprising:

a plurality of vertical supports, each having opposing U-shaped grooves extending along its longitudinal axis;

a plurality of horizontal supports adapted to be fixedly connected to said vertical support, each horizontal support having opposing U-shaped grooves extending along its longitudinal axis;

a plurality of rectangular frame members having outwardly exending flanges along at least two of its peripheral surfaces, each frame member being adapted to be freely suspended in a position defined by at least one vertical support and at least one horizontal support by arranging said flanges within corresponding U-shaped grooves, adjacent frame members being spaced from each other by a short distance; and further comprising

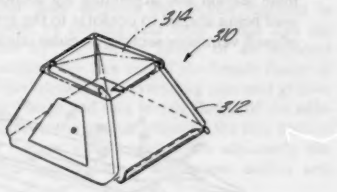
construction members connectable to said frame members and having slideable members adapted to be slideably inserted in the spaces between adjacent frame members for connecting said construction members to said frame members.

4,073,105

TEMPORARY STRUCTURE

Charles R. Daugherty, 29284 Hoover, Warren, Mich. 48093

Continuation-in-part of Ser. No. 310,597, Nov. 29, 1972, abandoned. This application Aug. 30, 1974, Ser. No. 502,172
Int. Cl.[2] E04B *1/343, 1/348*
U.S. Cl. 52—169.9 **5 Claims**



1. A temporary structure comprising:

a. a plurality of interconnected sidewalls defining an enclosure, each of the sidewalls comprising:

1. a polygonally shaped member having a substantially flat planar surface, and N edges; and

2. curled locking means integrally formed with the flat planar surface at at least N−1 edges thereof, the curled locking means being contiguous to and substantially co-extensive with the edge associated therewith, an opening being provided at the intersection of any two adjacent edges of the flat planar surface to provide means for the linear translation of any one locking means into any one locking means of another sidewall, to thereby render the locking means receivable within any other locking means, and wherein the curled locking means are formed at the edge of the planar surface such that the plane thereof is uninterrupted;

b. a top wall interconnected to each of the sidewalls, the top wall comprising:

1. a polygonally shaped member having a substantially flat planar surface and configured the same as the enclosure defined by the sidewalls, and

2. curled locking means integrally formed with the flat planar surface at each edge thereof, the curled locking means being contiguous to and substantially coextensive with the edge associated therewith, the member having an opening at the intersection of any two adjacent edges of the flat planar surface to provide means for the linear translation of any one locking means thereof into any one locking means of a sidewall, the curled locking means being formed at the edge of the planar surface such that the plane thereof is uninterrupted; and

c. at least one ground peg having one end insertable into a ground surface and the other end being insertable into the interior space defined by any two interlocked curled locking means; and

wherein the locking means of any one sidewall is received within the locking means of the adjacent sidewall and the locking means of the top wall adjacent thereto to interlock the sidewalls and the top wall.

4,073,106

END CAP AND CONNECTORS FOR ROOF RIDGE VENTILATOR

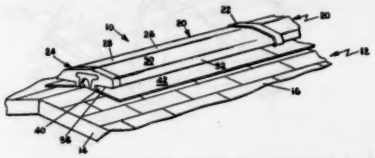
Richard C. Malott, Spring Lake, Mich., assignor to Lehigh Products, Inc., Coopersville, Mich.

Division of Ser. No. 597,036, July 18, 1975, Pat. No. 4,045,928. This application Sept. 24, 1976, Ser. No. 726,203
Int. Cl.[2] E04D *13/16*
U.S. Cl. 52—199 **4 Claims**

1. In combination, a roof ridge ventilator assembly having ends and being of the type including a plurality of ventilator sections extending longitudinally along the ridge of a roof,

each section having a hood portion integral with sidewall portions, panel portions and outwardly extending, downwardly angled flashing portions, wherein the improvement comprises:

flexible, resilient connectors joining adjacent longitudinally extending ventilator sections, each of said connectors including an intermediate, centrally cutout wall having a main section and depending leg sections, said connector wall being shaped to conform to the general cross section of each ventilator section, an outer connector jacket longi-



tudinally directed from each side of said intermediate wall and extending around the periphery of said wall, and an inner sleeve laterally spaced from and in a parallel relationship with said outer connector jacket and extending adjacent at least a portion of said periphery of said connector wall to thereby define slots adapted to sealingly receive and connect the ends of adjacent ventilator sections; and

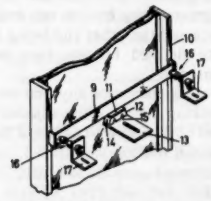
end caps carried by the ends of the roof ridge ventilator assembly to close off the ends of said assembly.

4,073,107

CURTAIN WALL STRUCTURE

Paul E. Rousseau, Uccle, Belgium, assignor to "Applications de la Chimle, de l'Electricite et des Metaux" en abrege:"-SADACEM", Brussels, Belgium

Filed Mar. 8, 1977, Ser. No. 775,545
Claims priority, application Belgium, Mar. 8, 1976, 839314
Int. Cl.[2] E04H *1/00*
U.S. Cl. 52—235 **6 Claims**



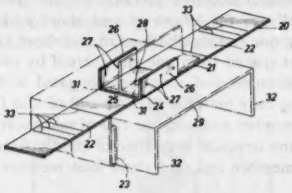
1. Curtain wall structure comprising a metal frame provided with a compensation bar for bearing on or hanging from a projecting element fastened to the building skeleton, each metal frame also comprising members for taking over the forces due to the wind, in which said projecting element is provided with resilient means on which said compensation bar bears, in which said resilient-material block is arranged inside a housing open at the top and soldered with the bottom thereof to said element while being provided with two side cut-outs in the compensation bar plane.

4,073,108

METHOD AND APPARATUS FOR RIGIDLY INTERCONNECTED CEILING AND WALL CONSTRUCTION

Arthur C. Williams, 21711 Glenbranch Drive, Spring, Tex. 77373

Continuation-in-part of Ser. No. 464,192, April 25, 1974, abandoned. This application Apr. 8, 1976, Ser. No. 674,963
Int. Cl.[2] E04H *1/00*
U.S. Cl. 52—238 **19 Claims**



1. A rigidly interconnected dry wall and ceiling structure for buildings, comprising:

a plurality of spaced inverted tee support members supported in said building,

a plurality of ceiling tiles adapted for supporting placement between said inverted tee support members for forming a building ceiling,

a structural wall channel member having an inverted U-shape for defining the upper structural support for a vertical wall,

a plurality of spaced hangers attachable to the flanges of said inverted tee support members and to said structural wall channel for rigidly interconnecting and supporting said structural wall channel member in closely spaced relation to said inverted tee support members, said hanger comprising a body member having legs extending from opposing ends thereof forming a generally inverted U-shape, said legs formed of a bendable material for forming depending legs spaced to receive at least a portion of said structural channel member therebetween and further bendable for supporting and securely gripping said member, and said body member further having a centrally located raised section for spacing said structural channel member from said inverted tee support member and gripping means located on said raised section of said body member, and

a plurality of wall panel members attachable to said structure wall channels for forming said vertical building wall.

4,073,109

METHOD AND APPARATUS FOR INSTALLING PANELS IN BUILDING CONSTRUCTION

Carlton N. Knutson, Fergus Falls, Minn., assignor to Construction Aids, Inc., Fergus Falls, Minn.

Filed June 30, 1976, Ser. No. 701,349
Int. Cl.[2] E04B *1/00*
U.S. Cl. 52—281 **1 Claim**

1. In a frame structure comprising truss rafters, outer walls upon which the rafters rest and to which thay are fastened, and an inner partition extending transversely to and having a plate near the lower surface of said rafters but not secured thereto, to permit normal vertical movement of said rafters under large roof loadings, in combination:

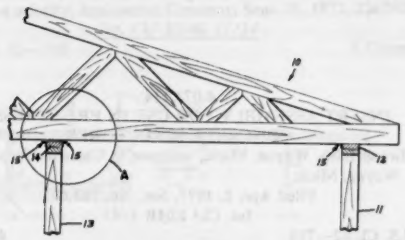
a sheet metal right-angle strip secured along substantially the entire top edge of said plate so that one leg of the angle extends downwardly and the other leg extends inwardly;

a sheet of ceiling panel having an edge received beneath and in the angle of said strip to engage the downwardly extending leg thereof;

means securing said ceiling panel to the under surfaces of

said rafters by a line of fasteners spaced from said angle strip;

a sheet of wall panel having an edge received beneath and in the angle of said angle strip, to supportively engage the lower face of said ceiling panel in said angle strip, and to laterally engage the downwardly extending leg of said angle strip;



and means securing said wall panel to said plate close to said angle strip,

the spacing between the angle strip and the first named means being sufficient for the inherent flexibility of the ceiling panel to accommodate normal vertical movement of the truss rafter with respect to the plate.

4,073,110

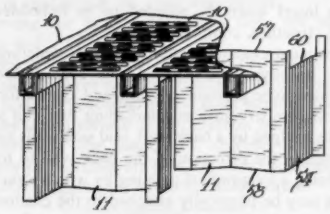
FLOOR DECK STRUCTURE

Samuel F. Kennedy, 415 E. Park, Taylorville, Ill. 62568

Filed Sept. 20, 1976, Ser. No. 724,588

Int. Cl.[2] E04C *1/30*; F24F *7/00*

U.S. Cl. 52—303 **4 Claims**



1. In a fabricated rigid floor deck structure assembled from a plurality of similar floor sections, each section being formed for engagement with an adjacent similar section to form an interlocking floor structure, a floor section comprising:

an elongate plate having generally planar top and bottom surfaces and a plurality of substantially parallel elongate embossments raised from the top surface, said embossments extending laterally continuously between points adjacent the opposite longitudinal edges of said plate and having openings formed through the sides of said embossment in a plane generally perpendicular to the plane of said plate to permit air flow from one side of the plate to the other.

a male flange having a generally U-shaped cross section and having inner and outer leg portions generally perpendicular to the plane of said plate, said male flange having its outer leg downwardly depending from one of said longitudinal edges of said plate, the inner leg of said male flange extending upwardly and having a free end positioned inwardly of said one edge lying above the plane of the bottom surface of said plate, one portion of the bottom surface having a longitudinal groove formed thereon aligned generally with said free end of said male flange with said free end extending into said groove; and

a female flange having a generally U-shaped cross section and having inner and outer leg portions generally perpendicular to the plane of said plate, said female flange having its inner leg downwardly depending from the other of said longitudinal edges of said plate, the outer leg of said female flange extending upwardly and having a free end positioned outwardly of said other edge lying above the plane of the bottom surface of said plate, said female flange defining an upwardly opening channel laterally outward from said plate, said flanges being dimensioned so that adjacent floor sections are locked together in suitable alignment by placing said male flange into the channel defined by the female flange of an adjacent aligned floor section, the free end of the female flange of the adjacent floor section also extending into said groove when said male flange and said female flange of the adjacent floor sections are engaged, whereby the free ends of the respective flanges when engaged are adjacently disposed stabilized against lateral movement within said groove.

4,073,111

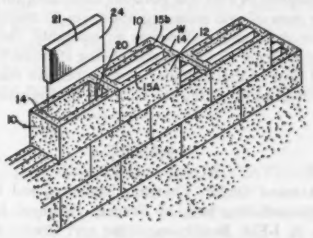
INSULATED MASONRY BLOCK

Millard R. Warren, Knoxville, Tenn., assignor to Warren Insulated Bloc, Inc., Knoxville, Tenn.

Continuation-in-part of Ser. No. 649,795, Jan. 16, 1976. This application Feb. 15, 1977, Ser. No. 768,760

Int. Cl.[2] E04B *2/00, 5/04*

U.S. Cl. 52—407 **12 Claims**



1. A thermally insulated masonry block comprising:

pairs of spaced opposed side walls and spaced opposed web walls defining a cavity therebetween;

a rectangular-shaped insulative plate formed of thermally insulative material disposed in said cavity and extending from one to the other of said web walls;

said insulative plate and said side walls being spaced apart to define air cells on opposite sides of said insulative plate; and

at least two aligned stub walls projecting into said cavity from respective ones of said side walls to reinforce said side walls;

said stub walls being of substantially the same height as said side and web walls and being spaced by a distance approximately the same as the thickness of said insulative plate.

4,073,112

STRUCTURAL PANEL

Gordon Francis Leiblich, Box 157, Kimba, South Australia, Australia

Filed Aug. 15, 1975, Ser. No. 604,987

Claims priority, application Australia, Aug. 20, 1974, 8585/74

Int. Cl.[2] E04C *5/16*

U.S. Cl. 52—677 **1 Claim**

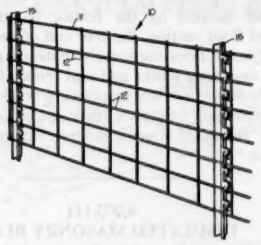
1. A structural panel comprising:

a. a mesh sheet having a plurality of rod portions having the same thickness and which are parallel with one another;

b. a plurality of stiffeners, each stiffener having:

1. a body portion which extends away from the plane in which the rod portions lie;

2. a plurality of tongues each joined to the body portion by a respective bridge portion which spaces the tongue from the body portion by a distance at least equal to said rod thickness, each bridge portion lying in a plane parallel to the plane in which the rod portions lie,
3. each tongue extending upwardly from the bridge portion to form therewith a slot which is open-ended in a first view of the stiffener, and each tongue having a forwardly projecting portion merging into a rearwardly



extending return portion to form a hook-like configuration which co-operates with said body portion to form a retaining aperture in a second view of the stiffener at right angles to the first said view; and

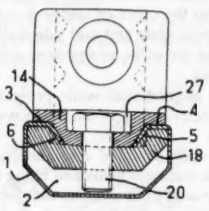
c. a plurality of said rod portions extending through respective ones of said retaining apertures to thereby retain the mesh sheet and stiffener as an assembly, the assembly of each stiffener to a mesh sheet being effected by positioning said slots of that stiffener over respective ones of said rod portions and rotating the stiffener through an angle of 90°.

4,073,113

BUILDING FRAME

Pierre Armand Oudot, Chatenay-Malabry, and Leon Petroff, Epinay-sur-Seine, both of France, assignors to Profiles et Tubes de l-Est, Beuilly-sur-Seine and Centre de Recherche d'Architecture d'Urbanisme et de Construction Rauc, Paris, both of France

Filed Aug. 18, 1975, Ser. No. 605,608
Int. Cl.[2] E04C *5/16*; E04B *1/38*
U.S. Cl. 52—710 **10 Claims**



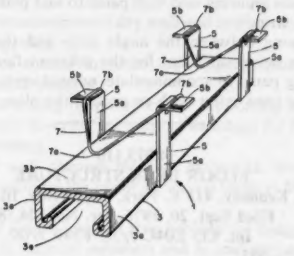
1. A fixing member for a building frame elongate structural element having at least one cavity which as seen in transverse section has a mouth permitting access to the cavity, defined by a pair of opposed flanges which have first portions extending towards each other across the mouth and second portions extending inwardly of the cavity from said first portions and terminating at free edges so as to leave to each side of the mouth an undercut space which is behind the first portion and laterally outside the second portion at that side, the second portions of the flanges being deformable by bending laterally, said fixing member having a body and a cap which has opposite end portions directed towards the body with respect to a central portion, the cap in a first position being insertable into the said cavity of the structural element and being rotatable after insertion from said first position to a second position in which said end portions lie behind said flanges of the structural element, and the fixing member further having means to urge together the body and the cap when the cap is in the second position so as to clamp said flanges, and the body and the cap being so shaped, as to deform at least one of said flanges by bending laterally during the clamping thereby securing the fixing member to the structural element in a manner inhibiting slippage along the structural element.

4,073,114

INSERT ASSEMBLY FOR USE IN PRE-STRESSED CONCRETE STRUCTURES

Elwood Irish, Wayne, Mich., assignor to Unistrut Corporation, Wayne, Mich.

Filed Apr. 1, 1977, Ser. No. 783,677
Int. Cl.[2] E04B *1/41*
U.S. Cl. 52—710 **4 Claims**



1. An insert assembly adapted to be imbedded within a concrete structure, comprising:

an elongated channel section to which structural members may be physically attached, said channel section being adapted to be positioned within and against formwork for a concrete structure and including first and second side walls bridged by a back wall, said side walls having edges turned in the direction of the back wall to form flanges defining a longitudinal opening by which structural members may be physically attached to the channel section;

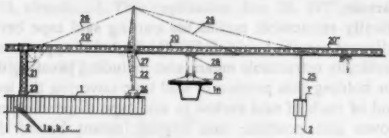
a plurality of pairs of rigid anchor members fixedly secured to and extending away from the channel section, each of the anchor members including a first portion attached to and extending away from the channel section at the back wall of the channel section and a second portion at an angle to the first portion; and

a plurality of spring members attached to the pairs of anchor members with each of the spring members being suspended between the anchor members of a different pair of anchor members in a direction toward the channel section, each of the spring members including first and second end portions attached to the second portions of a different pair of anchor members and a central portion integral with and intermediate to the end portions and at an acute angle with respect to the plane of the back wall of the channel section, said central portion being intermediate to and extending from the second portions of the anchor members in the direction of the back wall of the channel section, said plurality of spring members being operative to receive an elongated reinforcing member at the central portions thereof and to be deflected by said reinforcing member in a direction toward the back wall of the channel section, whereby when the spring members are deflected forces are established in the direction of the channel section for maintaining the insert assembly in place within and against the formwork for the concrete structure.

4,073,115
PROCESS FOR THE PRODUCTION OF A BRIDGE GIRDER SECTIONAL CANTILEVER CONSTRUCTION

Ulrich Finsterwalder, Munich, and Otto Seidl, Neubiberg, both of Germany, assignors to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Germany

Filed Sept. 27, 1973, Ser. No. 401,098
Claims priority, application Germany, Sept. 28, 1972, 2247609
Int. Cl.[2] E04G *21/14*
U.S. Cl. 52—745 **4 Claims**



1. The process for the cantilever production of a bridge girder system of prestressed concrete from prefabricated sections which have the hollow box cross-sectional configuration of the whole superstructure and are tightly drawn together to form a monolithically effective girer system comprising the steps of:

(a) providing a shuttering type of casting device of the cross-sectional shape of a substantial proportion of the bridge,

(b) separating the casting device into a plurality of transverse sections by sheet steel as the latter comes from the rolling mill,

(c) adding slack, reinforcing steel to the mold cavities and placing ducts adapted to form conduits for prestressing rods,

(d) casting concrete in the shuttering device,

(e) removing the hardened sections from the shuttering device, and

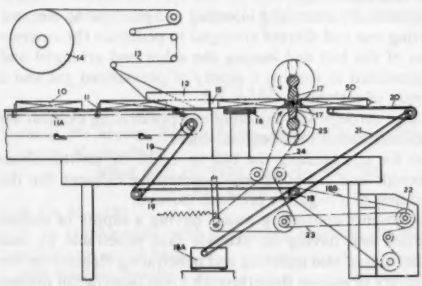
(f) assembling the sections at the bridge structure in the same order as they were cast and matching slight irregularities in the surfaces produced by the sheet steel on one section with the facing surface of the adjacent section,

(g) prestressing the assembled sections longitudinally whereby said sections are held together frictionally by the matching irregularities in the surfaces thereof.

4,073,116
WRAPPING MACHINES

William Glover, Newcastle-upon-Tyne, England, assignor to Baker Perkins Holdings Limited, England

Filed Nov. 3, 1976, Ser. No. 738,281
Claims priority, application United Kingdom, Nov. 12, 1975, 46763/75
Int. Cl.[2] B65B *9/06, 51/26*
U.S. Cl. 53—182 R **6 Claims**



1. A wrapping machine comprising

a tube former means for forming a web of wrapping material into a tube with a longitudinal seal;

means for continuously feeding a web of wrapping material to said tube former means;

an infeed conveyer for feeding articles in succession into said tube former means in order to be entubed in a tube of wrapping material;

a pair of opposed crimping dies positioned adjacent an outlet side of said tube former means which periodically contact the tube as it passes out of said tube former means and which then cooperate to form transverse seals in the tube of wrapping material between the succession of articles contained therein as said tube passes out of said tube former means;

a drive shaft;

means connected to said drive shaft to rotate said drive shaft at a constant speed;

means operatively connecting said drive shaft to at least one of said pair of opposed crimping dies for operation of said dies to form said transverse seals;

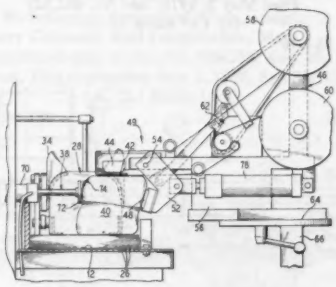
means for modulating the speed of movement of said pair of dies during their contact with the tube to the speed of movement of said tube out of said tube former means; and

said means operativey connecting said drive shaft to at least one of said pair of opposed crimping dies including an adjustable control mechanism, said control mechanism function into to disconnect operation of said at least one die from said drive shaft based on a predetermined, selected number of rotations of said drive shaft, thereby controlling the distance between transverse seals formed in the tube passing out of said tube former means.

4,073,117
PACKAGING MACHINE WITH INFLATED BAG PRINTER AND METHOD

James L. Shenoha, Lockport, Ill., assignor to Norwood Marking and Equipment Co., Inc., Downers Grove, Ill.

Filed Sept. 2, 1976, Ser. No. 719,823
Int. Cl.[2] B65B *61/02*
U.S. Cl. 53—14 **14 Claims**

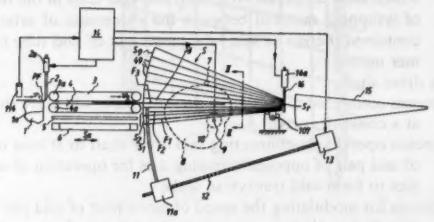


2. A method of imprinting product bags during an accelerated product bagging operation including the steps of continuously moving products along a conveying surface in spaced, aligned end-to-end relationship; positioning a deflated flexible bag in the path of the moving products adjacent the conveying surface; inflating the bag by means of an air jet; laterally shifting a portion of the inflated bag into contact with a marking device disposed off to the side of the moving products while maintaining a second portion of the flexible bag in a fixed position to intercept a moving product; and imprinting the inflated bag by said marking device during the time interval that the space between adjacent moving products is adjoining the marking device.

4,073,118
METHOD AND APPARATUS FOR ASSEMBLING AND POCKETING SECTIONS OF PHOTOGRAPHIC FILMS

Klaus Weber; Heinz Lüdemann; Andreas Schubert, and Karel Pustka, all of Munich, Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Nov. 10, 1976, Ser. No. 740,371
Claims priority, application Germany, Nov. 28, 1975, 2553612
Int. Cl.[2] B65B *35/30, 63/00*
U.S. Cl. 53—23 21 Claims

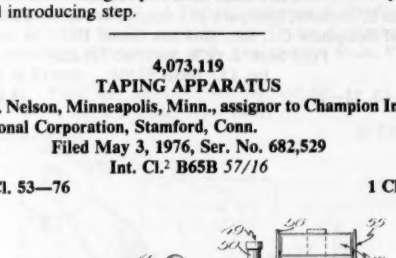


1. A method of inserting sections of elongated photographic films or the like into envelopes or analogous receptacles, comprising the steps of assembling successive pluralities of sections into discrete groups outside of the respective receptacles, including transporting successive sections of the respective plurality in a predetermined direction, arresting successive foremost sections and effecting a relative sidewise movement between each arrested section and the next foremost section such as is sufficient to enable the next foremost section to advance to a position previously occupied by the immediately preceeding section in which it at least partially overlaps the preceding section; and thereupon introducing each of the thus obtained groups into the respective receptacle, said assembling step further comprising maintaining the overlapping neighboring sections of each group out of contact with each other prior to said introducing step.

4,073,119
TAPING APPARATUS

Iver L. Nelson, Minneapolis, Minn., assignor to Champion International Corporation, Stamford, Conn.

Filed May 3, 1976, Ser. No. 682,529
Int. Cl.[2] B65B *57/16*
U.S. Cl. 53—76 1 Claim



1. Apparatus for applying tape to the top and ends of a carton of the type having abutting top closure flaps where the tape is located longitudinally to cover the abutting edges of said top closure flaps, and said top closure flaps have end tabs connected to the ends thereof which are folded downwardly to cover at least a portion of the end of said carton such that the tape must extend down the end of the carton to hold said tabs in position, said apparatus being operable sequentially and automatically on successive cartons as they are placed on said apparatus, said apparatus comprising:

rail means on which said cartons may be located at a load station and on which said cartons may be advanced in spaced apart pairs to their longitudinal axis;

reciprocating feed carriage means for engaging each of said cartons when placed on said rail means at said load station and advancing it into position beneath means for dispensing tape continuously and horizontally as said carton moves beneath said tape dispensing means, said tape dispensing means pressing said tape into position to cover a portion of the longitudinally extending abutting edges of said top cover flaps;

said feed carriage means also engagable with each of said cartons positioned beneath said tape dispensing means to advance each of said cartons along said rail means away from said tape dispensing means to a predetermined position leaving a length of tape extending between adjacent cartons;

vertically retractable means for cutting said tape between adjacent cartons being moved through said apparatus, said vertically retractable means also including pressing means for holding that portion of said tape covering the leading end of each of said carton in said tape dispending means down into position; said cutting means biased downwardly to hold said tabs in position on the leading end of a carton which is stationary beneath said dispensing means;

control means for sensing a carton introduced at said load station and activating said carriage means to advance said carton beneath said dispensing means, said control means coacting to retract said cutting means to allow the carton beneath said dispensing means to be moved by said carriage means along said rail means; and

elevator means includng a vertically reciprocating means for supporting a carton after the tape has been applied thereto and, after said tape has been cut, moving it upwardly into a chute which engages the ends of said carton and holds said tape and said end tabs in position to provide time for said tape to adhere to the tabs and ends of said carton.

4,073,120
APPARATUS FOR REPRESSURIZING TENNIS BALLS

Lloyd E. Berggren, 4924 1st Ave. S., Minneapolis, Minn. 55409

Filed Aug. 9, 1976, Ser. No. 712,605
Int. Cl.[2] B65B *31/08;* A63B *41/12*
U.S. Cl. 53—79 12 Claims

1. The apparatus for repressurizing balls having a continuous exterior skin including:

a longitudinally extending injecting and penetrating element having one end thereof arranged to penetrate the exterior skin of the ball and having the other end arranged and constructed to receive a supply of pressurized gas and a supply of sealant;

a passage through said injecting and penetrating element for communication between said ends;

means for compressing the ball to expel the air therefrom through said injecting and penetrating element for the building of a negative pressure therein;

sealant supply containing means having a supply of sealant therein and having an exterior skin penetrable by said other end of said injecting and penetrating element for the delivery of sealant therethrough upon penetration thereof and release of the negative prewithin the ball; and,

means for providing pressurized gas through said injecting

and penetrating element upon removal of said sealant supply.

4,073,121

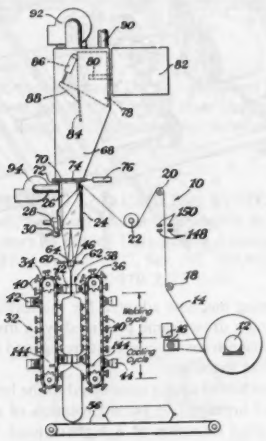
FORM, FILL AND SEAL INDUSTRIAL BAG MACHINE

Eddie Lee Greenawalt, and Lorenzo Dow Geren, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 572,594, April 28, 1975, which is a division of Ser. No. 460,864, April 15, 1974, Pat. No. 3,925,963, which is a continuation-in-part of Ser. No. 347,923, April 4, 1973, abandoned. This application Jan. 26, 1977, Ser. No. 762,682

Int. Cl.[2] B65B *9/12, 31/00*

U.S. Cl. 53—112 A 16 Claims



10. In apparatus for providing a flexible, generally vertical tube, simultaneously with the periodic dumping of premeasured product loads into the tube, and the collapsing and transverse sealing of the tube at spaced intervals to form therefrom filled bags, the combination which includes: a hollow mandrel about which the tube is formed, means to periodically clamp the tube underneath the filling mandrel, and means to draw the tube downwardly to provide a product receiving space for the product load, means in proximate positioning to the clamping means to transversely seal the tube, the improvement which comprises, evacuation means to partially evacuate the product receiving space, means to form a narrow channel between the inside surface of the tube and the mandrel, said channel forming means being adapted to provide communication between the product receiving space and the atmosphere to make available, cooperatively with the evacuation of the product receiving space, a stream of air that is sucked downwardly between the tube and the mandrel, to aspirate the inside surface of the tube to prepare a less contaminated sealing surface.

4,073,122

PRINTING APPARATUS

Peter D. W. Areson, Boston, Mass., assignor to Markem Corporation, Keene, N.H.

Filed Apr. 16, 1976, Ser. No. 677,780

Int. Cl.[2] B65B *61/26*

U.S. Cl. 53—131 8 Claims

2. In combination with a bagging machine for loading a product unit into a bag,

said machine having

bagging machine timing means

feed means to convey product units along a feed path

bag support means to support a stack of generally flat, uninflated bags adjacent said feed path

bag expanding means responsive to the approach of a product unit to said bag stack to expand a top bag of said stack, and

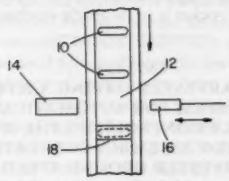
loading means to load a product into said expanded top bag,

printing apparatus comprising

a frame

a print head having a print face

bag deflecting means independent of said bag expanding means to deflect said expanded top bag, exposing at least a portion of the top surface of the next underlying unexpanded bag and



print head carrier means supported on said frame and responsive to said bagging machine timing means to move said print head in a curved path generally horizontally from a position remote from said bag stack to a position above said bag stack, thereafter to move said print head generally vertically downwardly into printing contact with said exposed bag surface, and thereafter to remove said print head to said remote position, before said bagging machine loading means loads a product unit into said expanded top bag

said print head carrier means including

a print head arm carrying said print head, and drive means connected to said arm for moving it bodily generally linearly in the direction of said path.

4,073,123

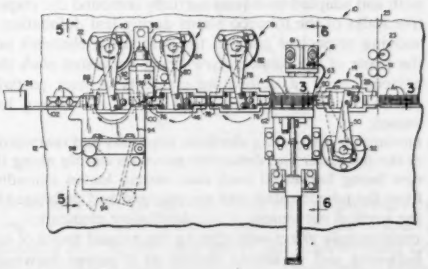
WRAPPING MACHINE

Lawrence W. Schoppee, Springfield, Mass., assignor to Package Machinery Company, East Longmeadow, Mass.

Continuation-in-part of Ser. No. 606,236, Aug. 20, 1975, abandoned. This application July 2, 1976, Ser. No. 702,036

Int. Cl.[2] B65B *11/32*

U.S. Cl. 53—234 33 Claims



26. In a wrapping machine, a rotary tumble box having a pair of diametrically opposite generally radially outwardly opening pockets each adapted to receive an article and its wrapper and journalled on the machine to alternately position each of said pockets in article receiving and article discharging positions, respectively, and an ejector mechanism including a plunger assembly carried by said tumble box and supported for recipro-

cal movement between article admitting and article ejecting positions relative to said pockets, said plunger assembly including a plunger extending through said tumble box between said pockets and having article engaging parts at its opposite ends, each of said parts being wholly disposed within an associated one of said pockets when said plunger assembly is in an article admitting position relative to said one pocket, said ejector mechanism including a single plunger operating member supported intermediate its ends on said tumble box to pivot about an axis intermediate said pockets, said operating member having an inner end portion operably engaging said plunger intermediate its ends and within said tumble box and having a free outer end portion extending outwardly beyond said tumble box, said ejector mechanism including a drive member supported on the machine for engaging and moving said free end portion to move said plunger assembly from an article admitting to an article ejecting position relative to one of said pockets when said one pocket is in its article discharging position.

4,073,124

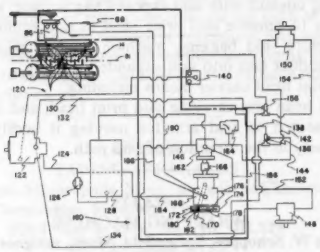
TOBACCO HARVESTER HAVING A HYDRAULIC CONTROL SYSTEM FOR AUTOMATICALLY AND CONTINUOUSLY CONTROLLING THE SPEED OF A LEAF DEFOLIATOR ASSEMBLY IN RELATION TO THE HARVESTER GROUND SPEED

Bertram Lee Jordan, and John Davis Mitchell, both of Lewiston, N.C., assignors to Harrington Manufacturing Company, Lewiston, N.C.

Division of Ser. No. 579,195, May 20, 1975, Pat. No. 3,999,359. This application Oct. 18, 1976, Ser. No. 733,095

Int. Cl.[2] A01D *45/16*

U.S. Cl. 56—1 **2 Claims**



1. A method of harvesting tobacco comprising the steps of:

a. moving a tobacco harvester having a defoliator forwardly along a row of tobacco plants having tobacco leaves extending therefrom, the defoliator being of the type having a plurality of defoliating elements associated therewith and adapted to at least partially surround the respective stalks of the tobacco plants during leaf defoliation;

b. moving respective pairs of the defoliating elements into the plane of the tobacco row being harvested such that adjacent pairs of defoliating elements at least partially surround certain tobacco stalks of the row being harvested;

c. moving the defoliating elements vertically and rearwardly as the harvester and defoliator move forwardly along the row being harvested such that certain leaves extending from the tobacco stalk and are engaged and defoliated by the vertical movement of the defoliating elements;

d. continuously effectively sensing the ground speed of said harvester and variations therein as it moves forwardly along the tobacco row being harvested; and

e. directing a system of hydraulic fluid in response to the effectively sensed harvester ground speed to a hydraulic drive motor operative to drive said defoliator for driving the hydraulic drive motor and defoliator in proportion to the effectively sensed harvester ground speed, and varying the volumetric flow rate of fluid directed to said hydraulic drive motor in response to variations in harvester ground speed so as to continuously drive said defoliator in proportion to the harvester ground speed irrespective of changes therein.

4,073,125

DRIVE MECHANISMS OF SPINNING OR TWISTING MACHINES ADAPTED FOR THE FORMATION OF KNOP YARN

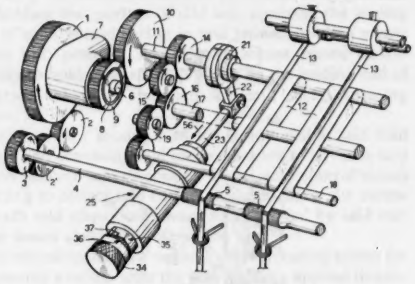
Giuseppe Bolli, Campore di Vallemosso (Vercelli), Italy

Filed Jan. 21, 1977, Ser. No. 761,032

Claims priority, application Italy, Feb. 13, 1976, 67330/76

Int. Cl.[2] D01H *5/36*

U.S. Cl. 57—38.3 **7 Claims**



1. In a spinning machine adapted for the formation of knop yarn and having a draw frame provided with lower yarn feed rollers, and a drive transmission for driving said feed rollers, a drive mechanism including:

a first unidirectional clutch connected to the lower yarn feed rollers and arranged to permit rotation of said rollers in the yarn feed direction at a higher speed than that imparted to said rollers by the drive transmission;

actuator means separate from the drive transmission;

a second unidirectional clutch connecting said actuator means to said lower feed rollers and arranged to permit increase in the speed of said lower feed rollers relative to their normal running speed upon operation of the actuator means, and

control means for effecting operation of the actuator means at predetermined times and for predetermined intervals to cause the formation of knops at intervals in yarn fed through the drawing frame in use of the machine.

4,073,126

OPEN-END SPINNING DEVICE

Pierre Hubert Marie Joseph Bouhon, Heusy (Verviers), Belgium, assignor to Societe Anonyme des Ateliers Houget Duesberg Bosson, Verviers, Belgium

Filed Sept. 30, 1976, Ser. No. 727,999

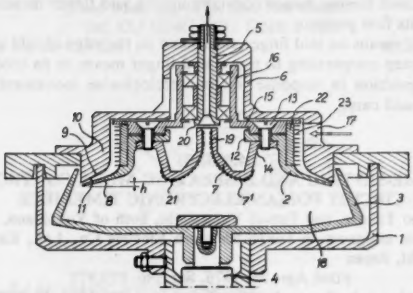
Claims priority, application Belgium, Oct. 3, 1975, 834173

Int. Cl.[2] D01H *1/12*

U.S. Cl. 57—58.95 **7 Claims**

1. In an open-end spinning unit for producing yarn from fiber material, said unit comprising a casing having an inlet for the fiber material to be treated and an inlet cone with an edge, a spinning turbine having a circumferential portion to enclose a space in said casing in which said yarn is formed, an opening-up member rotatably mounted in said casing having a substantially cylindrical portion provided on its outer periphery with needle means and a bottom outwardly flaring flange cooperating with the said edge of the inlet cone to form a radial annular slot through which the fibers are introduced from the inlet into the spinning turbine after having been subjected to the needle means, an exit tube for the yarn formed connected with the casing, a sleeve rotatably mounted around the yarn exit tube,

and a hollow funnel-shaped yarn guiding member projecting into said space in said turbine and means fixing said funnel-shaped guiding member to said opening-up member to rotate



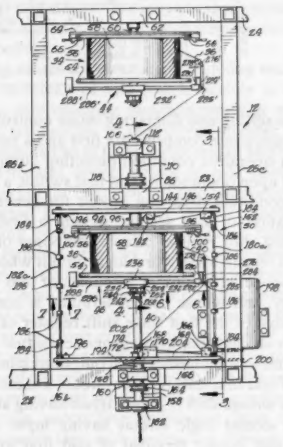
with the latter, the bottom of the funnel-shaped member being at a higher level inside the turbine than the end of the outwardly flaring flange of the opening-up member.

4,073,127

TWINING AND CABLING SYSTEM

John F. Orlandi, Lombard, and John E. Rauch, St. Charles, both of Ill., assignors to Belden Corporation, Geneva, Ill.

Filed Feb. 7, 1977, Ser. No. 765,992
Int. Cl.[2] D07B *3/12, 3/00*
U.S. Cl. 57—58.36 **24 Claims**



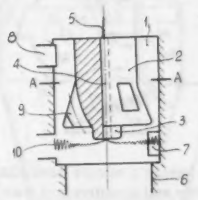
1. Apparatus for uniformly twining a pair of elongate filaments, comprising, in combination, frame means defining forward and rearward ends of said apparatus, first supply reel means adapted to have a first elongate filament wound thereon and being nonrotatably supported by said frame means with the axis of said first reel means substantially horizontal, first payoff arm means supported forwardly of said first supply reel means for rotation about and in a plane substantially perpendicular to the axis of said first supply reel means, said payoff arm means including guide means thereon positioned radially outwardly from the axis of said first reel means a distance greater than the maximum wound radius which said first filament may have on said first reel, said guide means being adapted to receive said first elongate filament in guided relation therewith and being cooperative with said first filament to cause rotation of said first payoff arm means and effect let-off of said first filament from said first reel means under substantially constant tension when said first filament is subjected to an axial force sufficient to draw said first filament over said guide means from said first reel means, second supply reel means adapted to have a second elongate filament wound thereon and being supported by said frame means forwardly of said first supply reel means with the axis of said second supply reel substantially horizontal, second payoff arm means supported forwardly of said second supply reel means for rotation about and in a plane substantially perpendicular to the axis of said second supply reel means, said second payoff arm means including second guide means thereon positioned radially outwardly from the axis of said second reel means a distance greater than the maximum wound radius which said second filament may have on said second reel, said second guide means being adapted to receive said second elongate filament in guided relation therewith and being cooperative with said second filament to cause rotation of said second payoff arm means and effect let-off of said second filament from said second supply reel means under substantially constant tension when said second filament is subjected to an axial force sufficient to draw said second filament over said second guide means from said second supply reel means, flyer means supported by said frame means for guiding said first elongate filament around said second supply reel means and associated second payoff arm means as said first filament is paid out from said first supply reel means, means for receiving said second elongate filament from said second payoff arm means and positioning said second elongate filament in substantially side-by-side relation with said first filament after said first filament is guided around said second reel means and said associated second payoff arm means, and drive means operatively associated with said flyer means in a manner to effect rotation of said flyer guide means substantially about the axis of said second supply reel means so as to effect twining of said first and second elongate filaments about each other after they are positioned in said side-by-side relation.

4,073,128

METHOD AND APPARATUS FOR MANUFACTURING OF YARN

Jerzy Ostrowski; Piotr Sierputowski, both of Warsaw; Lukasz Turkowski, Sule Jowek-Ratajewo; Jerzy Jablkiewicz; Jan Pacholski, both of Lodz, and Tadeusz Jedryka, Warsaw, all of Poland, assignors to Centralny Osrodek Badawczo-Rozwojowy Maszyn Wlokienniczych, Lodz, Poland

Filed Mar. 3, 1977, Ser. No. 774,113
Claims priority, application Poland, Mar. 10, 1976, 187856
Int. Cl.[2] D01H *1/12*
U.S. Cl. 57—58.89 **2 Claims**



2. An apparatus for manufacturing yarn, employing a cylindrical, non-rotational spinning chamber having a source of vacuum at one end; the other end of said chamber being closed with a cylindrical insert incorporating a concentric channel to discharge ready yarn; duct means for supplying air to said chamber interior; fibre delivery channel means disposed within said chamber including: cylindrical insert means disposed at a yarn discharge side, said insert having peripheral ports diagonally arranged in relation to a centre line of said chamber, and port inlet means disposed between said discharge channel and said duct means.

4,073,129

METHOD AND APPARATUS FOR MANUFACTURE OF YARN

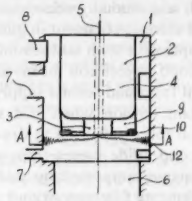
Jerzy Ostrowski; Piotr Sierputowski, both of Warsaw; Lukasz Turkowski, Sule Jowek-Ratajewo; Jerzy Jablkiewicz; Jan Pacholski, both of Lodz, and Tadeusz Jedryka, Warsaw, all of Poland, assignors to Centralny Osrodek Badawczo-Rozwojowy Maszyn Wlokienniczych, Lodz, Poland

Filed Mar. 3, 1977, Ser. No. 774,114

Claims priority, application Poland, Mar. 10, 1976, 187857

Int. Cl.[2] D01H *1/12*

U.S. Cl. 57—58.89 **2 Claims**



2. An apparatus for manufacturing yarn, employing a cylindrical, non-rotational spinning chamber provided at one end with a source of vacuum, and being closed at the other end by a cylindrical insert incorporating a yarn discharge channel; peripheral duct means disposed in said chamber to supply air; and fibre delivery means disposed within an upper portion of said chamber, wherein: said cylindrical insert lower face being provided with re-stricting blades, and said chamber having outlet means at the vacuum source side provided with air guides.

4,073,130

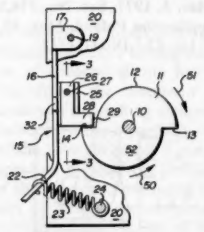
CHIME CLOCK WITH MINUTE HAND SHAFT ROTATABLE IN BOTH DIRECTIONS

Christian M. J. Jauch, Louisville, Miss., assignor to Spartus Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 671,143, March 29, 1976, Pat. No. 4,036,004. This application June 8, 1976, Ser. No. 693,915

Int. Cl.[2] G04B *21/02*; G04C *21/04*

U.S. Cl. 58—9 **9 Claims**



1. In a clock having a minute hand shaft capable of rotation in both clockwise and counterclockwise senses:

a cam having at least one cam step with an edge;

means mounting said cam for rotation in said clockwise and counterclockwise senses with said minute hand shaft;

cam follower means comprising a lever;

means mounting said lever for pivotal movement toward and away from said cam;

first biasing means normally urging said lever toward said cam;

finger means carried on said lever for engaging the periphery of said cam;

means mounting said finger means on said lever for movement between (a) an operative first position in which said finger means is disposed to engage the periphery of said cam and obstruct counterclockwise rotation of said cam and (b) a displaced second position in which the finger means is incapable of engaging the periphery of said cam or of obstructing said counterclockwise rotation;

second biasing means normally urging said finger means to its first position;

and means on said finger means and on the edge of said cam step cooperating to move said finger means to its second position in response to counterclockwise movement of said cam.

4,073,131

TIME-SETTING AND DISPLAYING MODE CONTROL CIRCUIT FOR AN ELECTRONIC TIMEPIECE

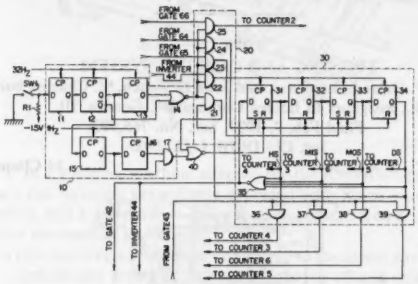
Tuneo Takase, and Tetsuo Yamaguchi, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 26, 1976, Ser. No. 679,971

Claims priority, application Japan, Apr. 28, 1975, 50-50793

Int. Cl.[2] G04B *27/08*; G04C *3/00*

U.S. Cl. 58—23 R **13 Claims**

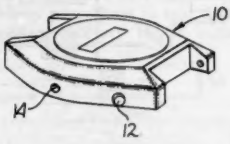


1. A time-setting and displaying mode control circuit for an electronic timepiece comprising a first and a second switch, a first-switch operative condition detecting circuit for generating a signal upon operation of said first switch, a second-switch operative condition detecting circuit for generating a signal upon operation of said second switch, a first ring counter having a first shift register circuit composed of cascade connected shift registers and a first logic circuit whose input terminals are connected to output terminals of said shift registers, respectively, and whose output terminal is connected to the input terminal of the first stage shift register of said first shift register circuit, and adapted to generate a signal corresponding to one of time-setting modes from output terminals of said shift registers of said first shift register circuit, a second ring counter including a second shift register circuit having at least one shift register, a second logic circuit having input terminals connected to said output terminal of said first logic circuit, an input terminal of said second shift register circuit, and an output terminal of said at least one shift register of said second shift register circuit, and controlled by an output signal from said first logic circuit to generate a signal corresponding to one of time-displaying modes, a first mode control circuit connected to said first-switch operative condition detecting circuit and adapted to shift, upon operation of said first switch under a time-setting mode, the content of said first ring counter and to change-over, upon operation of said first switch under either one of first and second specified time displaying modes, said time displaying mode to a corresponding one of first and second specified time setting modes by setting a specified shift register of said first shift register circuit, and a second mode control circuit connected to said second-switch operative condition detecting circuit and said first logic circuit and adapted to generate an output signal to shift the content of said second ring counter each time said second switch is operated during a time-displaying mode period.

4,073,132
WATCH CASE CONSTRUCTION

Sigurd Frohlich, 22951 Aegean Sea Drive, Laguna Niguel, Calif. 92677

Filed Mar. 15, 1976, Ser. No. 666,887
Int. Cl.[2] G04C 3/00; G04B 37/00
U.S. Cl. 58—23 BA 8 Claims



1. An electronic watch comprising:

a. a case forming a cavity, said cavity adapted to receive an electronic watch module, said watch module having electrical battery terminals disposed on one surface thereof;

b. a back member disposed on said case so as to close said cavity, said member having an interior surface;

c. an inner-cover disposed within said case to engage said interior surface of said back member, and resiliently engage said terminals of said module, said inner-cover comprising:

i. a generally flat circular cover member, said cover member comprising upper, lower and side surfaces, said side surfaces structured and configured so as to extend perpendicularly from the periphery of said upper surface, such that said side surface may circumferentially engage said watch module, said cover member being electrically conductive,

ii. coupling means for electrically coupling said electrical battery terminals of said watch module to said cover member, said coupling means comprising at least one resilient tab portion of said cover member structured and configured so as to have one end of said tab portion coupled to said upper surface of said cover member while having the remainder of said tab portion protruding upward from said cover member such that said protruding portion resiliently engages said electrical battery terminals, thereby flexing said resilient tab such that said portion firmly engages said battery terminals;

iii. spring means for urging said coupling means toward said electrical battery terminals, said spring means comprising at least one resilient tab portion of said cover member structured and configured so as to have one end of said tab portion coupled to said lower surface of said cover member while having the remainder of said tab portion protruding downward from said cover member such that said protruding portion resiliently engages said interior surface of said back member, thereby flexing said resilient tab such that said coupling means is urged toward said battery terminals, resulting in electrical coupling of said battery terminals, said cover member and said back member.

4,073,133
ELECTRONIC CHIME AND STRIKE SYSTEM

David E. Earls, Norwalk, and C. N. Damodaran Nampoothiri, Stamford, both of Conn., assignors to General Time Corporation, Thomaston, Conn.

Filed Apr. 13, 1976, Ser. No. 676,485
Int. Cl.[2] G04C 21/04, 21/16
U.S. Cl. 58—13 17 Claims

1. An electronic strike and chime generating system and the like comprising in combination:

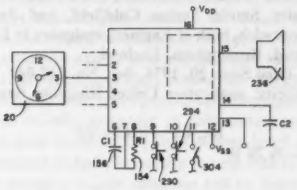
a. means commanding a chime program comprising a plurality of notes in ordered sequence;

b. means activating said chime program commanding means upon at least each hour interval;

c. means commanding a strike program, said strike program commanding means activated upon each said hour interval after completion of said chime program;

d. frequency synthesizer means;

e. means electrically connecting said frequency synthesizer both to said strike and chime program commanding means for response to the same thereby providing a plurality of



outputs each comprising a multiple of the frequency of the fundamental tone of at least some of said notes of said programs;

f. means for generating the fundamental frequency with selected harmonics of all notes of said programs;

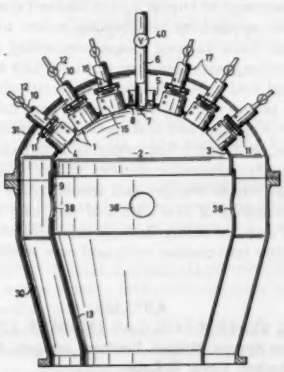
g. a loud speaker responsive to said generating means for sounding said programs; and

h. means electrically connecting said loud speaker and said generating means.

4,073,134
GAS TURBINE COMBUSTOR FED BY A PLURALITY OF PRIMARY COMBUSTION CHAMBERS

Hans Koch, Zurich, Switzerland, assignor to BBC Brown Boveri & Company, Limited, Baden, Switzerland

Filed Apr. 2, 1975, Ser. No. 564,480
Claims priority, application Switzerland, Apr. 3, 1974, 4664/74
Int. Cl.[2] F02C 9/14; F02G 3/00
U.S. Cl. 60—39.29 6 Claims



1. A gas turbine combustion system comprising

a large secondary combustion chamber having a spherical wall about one end;

a plurality of smaller primary combustion chambers disposed in a spherical array on said wall, each primary combustion chamber having a wall extending through said spherical wall and terminating in an outlet directed into said secondary combustion chamber and each primary combustion chamber being of a length whereby combustion is not completed therein and being operative to project a flame into said secondary combustion chamber

for igniting a mixture of fuel and air in an adjacent primary combustion chamber;

at least one starter burner disposed in the center of said spherical array of primary combustion chambers; and

means for supplying fuel and means for supplying air to each primary combustion chamber, at least some of said air supply means being adjustable to control the supply of air.

4,073,135

CONTROL VALVES FOR FLUIDS

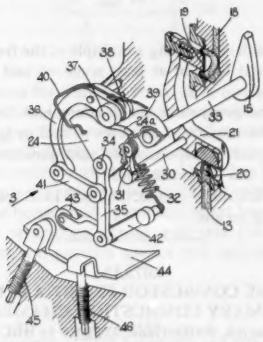
Trevor Stanley Smith, Sutton Coldfield, and Joseph Louis Bloom, Droitwich, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Sept. 20, 1976, Ser. No. 725,049

Claims priority, application United Kingdom, Sept. 26, 1975, 39474/75

Int. Cl.² F02C 9/08

U.S. Cl. 60—39.28 R **8 Claims**



1. A fluid flow control valve, including an orifice, a control element for said orifice, means, responsive to an input pressure signal, for moving said control element relatively to said orifice, biasing means for urging said control element against the force applied by said input pressure signal, and means responsive to operation of an engine power demand control for varying the force applied by said biasing means to said control element, said force varying means comprising a cam, a cam follower coacting with said cam and with said biasing means, said cam and said cam follower being relatively movable by said engine power demand control, said cam follower including a movable element and first and second rollers mounted on said element, said first roller engaging a surface on said cam, and a resiliently deformable member which is fixed relative to said cam and which engages said second roller in all relative operating positions of said cam and said cam follower, said deformable member acting through said second roller to urge said first roller into contact with said cam surface.

4,073,136

FUEL SYSTEM FOR GAS TURBINE ENGINES

Roger James Symon, Bristol, England, assignor to Rolls-Royce (1971) Limited, Great Britain

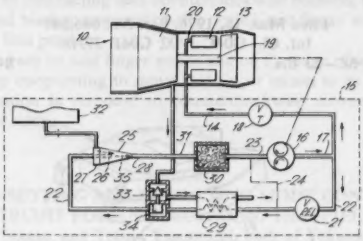
Filed Aug. 27, 1976, Ser. No. 718,418

Claims priority, application United Kingdom, Sept. 12, 1975, 37535/75

Int. Cl.² F02C 9/10

U.S. Cl. 60—39.28 R **1 Claim**

1. A fuel system for a gas turbine engine, comprising a fuel source, a low pressure jet pump having an inlet chamber connected to said fuel source, said pump including a nozzle for energizing the fluid in the chamber and an outlet for the energized fluid, a filter, a high pressure pump, conduit means connecting in series said outlet of said jet pump said filter said high pressure pump and the engine, and a branch conduit extending from said high pressure pump to said nozzle of the jet pump to supply energizing fluid thereto, said branch including a heater



for the fluid passing through said branch thereby to heat the fluid supplied by said jet pump to said filter.

4,073,137

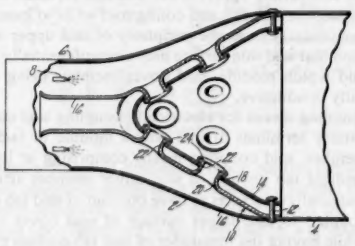
CONVECTIVELY COOLED FLAMEHOLDER FOR PREMIXED BURNER

Richard Roberts, Marlborough, Conn., assignor to United Technologies Corporation, Hartfort, Conn.

Filed June 2, 1976, Ser. No. 692,172

Int. Cl.² F02C 7/22

U.S. Cl. 60—39.32 **9 Claims**



6. A flameholder for positioning within a burner, the latter including a housing to which combustible fuel-air mixture is supplied, said flameholder including

an outer wall positioned within and spaced from the housing,

an inner wall located within and in spaced relation to the outer wall to define a cooling space therebetween,

said inner and outer walls having aligned openings therein for admitting the combustible mixture to the space combustion chamber within the inner wall,

said outer wall having integral inwardly extending sleeves thereon surrounding at least some of the holes therein and projecting inwardly through the aligned holes in the inner wall, the sleeves being smaller in diameter than the holes receiving them to provide a clearance therebetween, and

lateral flanges on the inner ends of the sleeves to overlie the inner surface of the inner wall adjacent the holes therein, said flanges being free of attachment to the inner wall and being closely spaced from the inner wall to provide a clearance therebetween.

4,073,138

MIXED MODE ROCKET ENGINE

Rudi Beichel, Sacramento, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

Filed May 28, 1974, Ser. No. 473,560

Int. Cl.² F02K 9/02

U.S. Cl. 60—245 **16 Claims**

1. A rocket engine for effectively utilizing different propel-

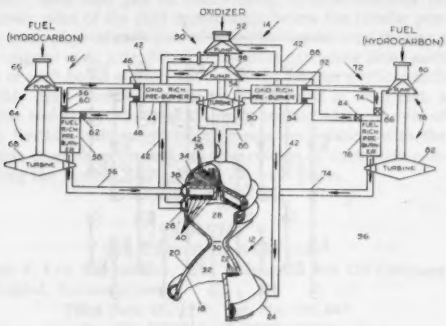
lant combinations having different densities during different portions of a rocket flight, said engine comprising:

a thrust chamber for receiving combustibly interactive propellants and providing a thrust-generating gaseous output flow;

first propellant delivery means for supplying a high-density propellant to said thrust chamber;

second propellant delivery means for supplying a low-density propellant to said thrust chamber; and

third propellant delivery means for supplying a propellant that is combustibly interactive with both said high-density and said low-density propellants to said thrust chamber, said third propellant delivery means including pump



means, first preburner means for combustibly interacting said first and third propellants to produce a gaseous output, second preburner means for combustibly interacting said second and third propellants to produce a gaseous output, and motor means for driving said pump means disposed to receive the gaseous outputs from both said first and second preburner means and be driven by either of said outputs; and

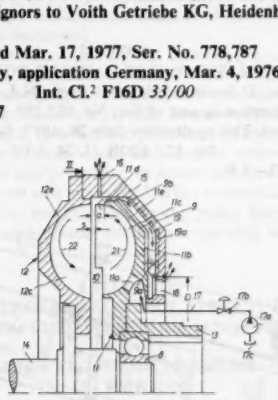
control means for varying the relative quantities of said propellants supplied to said thrust chamber to thereby provide the thrust chamber with different propellant combinations having different densities during different portions of a rocket flight.

4,073,139

HYDRODYNAMIC COUPLING

Waldemar Armasow, and Hans Lindenthal, both of Heidenheim, Germany, assignors to Voith Getriebe KG, Heidenheim, Germany

Filed Mar. 17, 1977, Ser. No. 778,787
Claims priority, application Germany, Mar. 4, 1976, 2614476
Int. Cl.[2] F16D *33/00*
U.S. Cl. 60—357 **17 Claims**



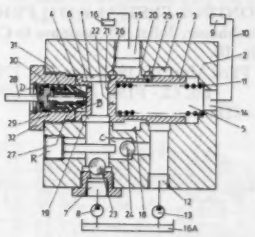
1. A hydrodynamic coupling comprising coaxial rotary bladed impeller and runner elements defining a toroidal working chamber for working fluid which transmits torque from said impeller element to said runner element, said chamber having a radially outermost region and the magnitude of transmitted torque being dependent on the degree of filling of said chamber with fluid, said torque increasing in response to increasing ratio of RPM of said impeller element to RPM of said runner element whereby the pressure of fluid which circulates in said chamber increases abruptly as a result of abrupt increase of said ratio; and a casing element having at least one section rigid with one of said first mentioned elements and surrounding the other of said first mentioned elements, at least one of the elements including said casing element and said other element defining a compartment in communication with said outermost region of said chamber so that the liquid level in said compartment normally equals approximately the liquid level in said chamber but the liquid level in said compartment advances toward the common axis of said impeller and runner elements in response to abrupt rise of fluid pressure in said chamber, said coupling having at least one opening communicating with said compartment radially inwardly of said outermost region to discharge at least some of the fluid whose level advances in said compartment radially inwardly in response to said abrupt rise of fluid pressure in said chamber and to thereby limit the magnitude of said torque on abrupt change in speed of said impeller element, especially an abrupt increase in RPM of said impeller element.

4,073,140

CONNECTING VALVE FOR RESERVE PUMP

Armin Lang, Schwabisch Gmund, and Rolf Fassbender, Mutlangen, both of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany

Filed Mar. 19, 1976, Ser. No. 668,415
Claims priority, application Germany, Mar. 21, 1975, 2512432
Int. Cl.[2] F15B *20/00*
U.S. Cl. 60—405 **1 Claim**



1. In a booster steering hydraulic system having a main pump (**8**), a reserve pump (**13**), and a sump (**16**), for operating a pressure operated consumer (**9**);

a valve device for selectively controlling flow to said consumer device from said pumps comprising housing means (**2**) having a pair of pressure chambers (**4,5**) and a bore (**1**) therebetween;

a pressure operable valve member (**3**) movable in said bore, and bias means biasing said valve member to a neutral position within said bore;

said valve member comprising a valve piston having ends effecting walls of respective pressure chambers one said end comprising a radial wall;

said valve member ends being exposed to pressure of respective pressure chambers wherein differential pressure is operative to shift said valve member from said neutral position in opposition to said bias means;

said housing means having pump outlet passages (**7,12**) and a sump passage (**15**) for connection to respective pumps and to said sump;

a radial passage (**21**) through said valve member radial wall connecting with said pump outlet passages;

a throttle (**22**) through said radial wall and said throttle

connecting said radial passage with one of said pressure chambers;

means (**11**) for communicating said one pressure chamber with a consumer whereby flow from said pumps pass through said throttle to said consumer (**9**);

a bore (**6**) in said radial passage whereby pressure in said radial passage is communicated to the other pressure chamber thereby to effect a differential pressure between said pressure chambers for acting on respective ends of said valve member for actuation thereof;

coacting flow control means (**25,26**) in said housing means and in said valve member operative to block flow to said sump in neutral position of said valve member;

actuation of said valve member to a first position responsive to a predetermined degree of differential pressure between said pressure chambers effecting coaction of said flow control means (**25**) to direct the flow from said reserve pump to said sump;

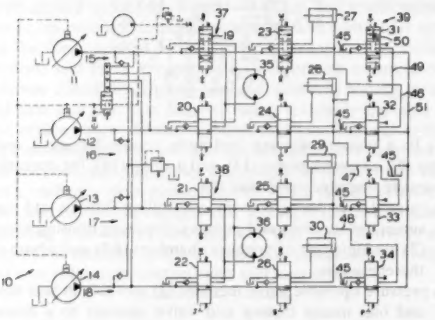
increased pressure differential pressure actuating said valve member to a second position to effect a coaction of said flow control means (**26**) to also direct a portion of the flow from the main pump to said sump.

4,073,141

FLUID CONTROL SYSTEM WITH PRIORITY FLOW

Kenneth R. Lohbauer, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 17, 1977, Ser. No. 778,651
Int. Cl.[2] F15B *13/06, 13/09*
U.S. Cl. 60—421 **12 Claims**



1. In a fluid system having a plurality of pumps, left and right track motors, and a plurality of work elements, the improvement comprising:

first means for controllably delivering fluid from a first plurality of said pumps to the left track motor and for controllably bypassing the left track motor and delivering fluid from each of the first plurality of pumps to a separate respective work element; and

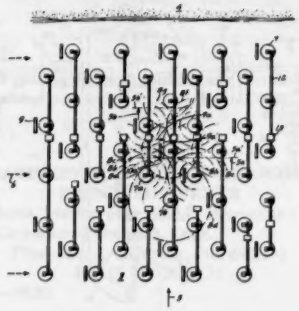
second means for controllably delivering fluid from a second different plurality of said pumps to the right track motor and for controllably bypassing the right track motor and delivering fluid from each of the second plurality of pumps to a separate respective work element.

4,073,142

WAVE-ACTION POWER APPARATUS

Michael G. Tornabene, 462-7th Ave., New York, N.Y. 10018

Continuation-in-part of Ser. No. 507,127, April 11, 1975, abandoned, and a continuation-in-part of Ser. No. 566,984, April 10, 1975, and a continuation-in-part of Ser. No. 566,983, April 10, 1975, and a continuation-in-part of Ser. No. 566,985, April 10, 1975, and a continuation-in-part of Ser. No. 432,211, Jan. 10, 1974, abandoned, and a continuation-in-part of Ser. No. 428,349, Dec. 26, 1973, abandoned. This application May 16, 1975, Ser. No. 578,178
Int. Cl.[2] F03G *7/10*
U.S. Cl. 60—502 **9 Claims**



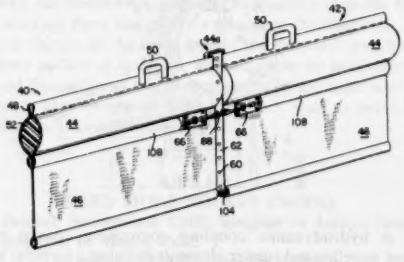
1. A wave energy device comprising in combination: a plurality of floats in water, spaced apart from one-another predetermined distances and positioned in substantially off-set positions from one-another in substantially non-lineal alignment relative to a predetermined direction of wave movement by virtue of said predetermined distances and said positioned state such that different ones of the plurality are intercepted by substantially common waves at different points in time, said predetermined distances being within a range of dimensions sufficiently small and sufficiently great such that floats' substantially concentric waves of turbulence moving substantially radially outwardly from each of the plurality coincide with one-another of others of the plurality at the floats whereby amplified reciprocating upward and downward motions occur to the floats at coinciding waves, at least one of said floats including leverage means for transmitting reciprocating motion of the one of the plurality.

4,073,143

BARRIER FOR WATER CARRIED POLLUTANTS

Paul Preus, 21 Smith Road, Toms River, N.J. 08753

Continuation-in-part of Ser. No. 683,189, May 4, 1976, abandoned. This application July 29, 1977, Ser. No. 820,239
Int. Cl.[2] E02B *15/04, 3/04*
U.S. Cl. 61—1 F **3 Claims**



1. A barrier for containing and controlling water carried

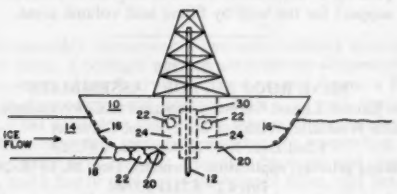
pollutants comprising a series of boom sections, each boom section comprising a generally tubular portion and a skirt portion, each of the tubular portions containing a flotation material, and means connecting the boom sections in end to end relationship characterized by generally liquid impervious connectors for the ends of the boom sections; a first vertical flap extending along one edge of one end of the skirt portion and the tubular portion of each boom section; a pair of flaps extending along the other edge of the opposite end of the skirt portion and the tubular portion of each boom section; said pair of flaps arranged to receive said first flap therebetween; separable connectors maintaining the first flap between said pair of flaps; a pair of rigid metallic plates at each end of each boom section; each said pair of plates being secured together on opposite sides of the skirt immediately below the tubular portion; each plate of each pair of plates having secured thereto a pair aligned eyes; a flexible draft member extending along each side of each boom section just below the tubular portion; each flexible draft member having an eye formed at each end; a double ended shackle detachable connecting adjacent eyes of each flexible draft member, and means cooperating with the flexible draft members and the aligned eyes of each plate connecting the flexible draft members to said plates.

4,073,144

ICE REMOVAL SYSTEM

James F. Lea, Fayetteville, Ark., assignor to Sun Oil Company Limited, Toronto, Canada

Filed June 15, 1976, Ser. No. 696,445
Int. Cl.[2] E02B *3/00*; B63B *35/08*
U.S. Cl. 61—1 R **10 Claims**



1. A system for protecting an object in a frozen waterway from possible damage caused by ice movement, and comprising:

a. a protective structure positioned between the object and the moving ice and having a moon pool therein in which the object is immersed;

b. said protective structure having deflecting means, on its bottom and directly adjacent to said moon pool, for breaking by deflecting downward any ice passing under the protective structure, whereby the downward deflection of the ice causes it to break into pieces which then float into said moon pool from which they may be removed,

c. and wherein said protective structure includes a channel extending from said moon pool to the surrounding waterway, whereby pieces of ice in the moon pool may be flushed out said channel into the surrounding waterway.

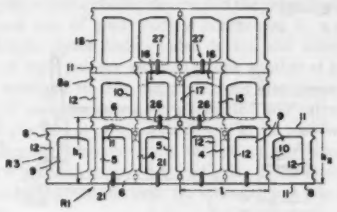
4,073,145

SHORE EROSION CONTROL STRUCTURE

Samuel S. Fair, Bay City, Mich., assignor to Sandgrabber, Inc., Bay City, Mich.

Filed June 17, 1977, Ser. No. 807,560
Int. Cl.[2] E02B *3/06*
U.S. Cl. 61—4 **15 Claims**

1. A shore erosion control structure comprising a wall extending longitudinally along a shoreline, said wall comprising a plurality of substantially parallel rows of block members arranged end to end, at least some of said rows having a plurality of courses of said block members, each of said block members having at least one opening extending completely therethrough and facing seaward, the openings in the block members of adjacent rows being in communication with each other to enable the passage of water through said wall, but being out of register with each other to provide tortuous passageways through which water may flow, and the block members of the



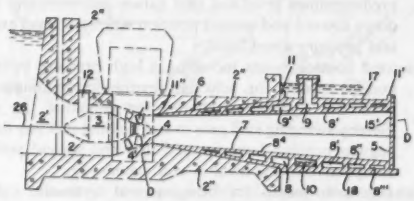
lowermost course of the most seaward row having a height greater than the height of the corresponding block members of the next adjacent row, whereby the block members of the lowermost course of the most seaward row project above the corresponding block members of the next adjacent row and overlap the lower portion of the block members forming the next higher course of said next adjacent row.

4,073,146

SUBMERSIBLE DIFFUSER

Francisco José Gutierrez Atencio, Diamante 3105 Entre Rios, Argentina

Filed July 8, 1976, Ser. No. 703,569
Claims priority, application Argentina, July 14, 1975, 259566
Int. Cl.[2] E02B *9/00*
U.S. Cl. 61—19 **7 Claims**



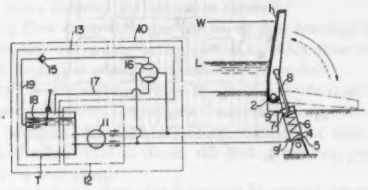
2. In a hydroelectric power plant having means for directing water through a power generation unit for causing actuation thereof; the improvement comprising a diffuser incorporating a hollow body defined by a lateral wall, such body having a first open end positioned against the outlet of said dam water directing means for receiving the water emerging therefrom, and a second open end for discharging the water entering said first end; the opening of said first end of smaller cross sectional area than the opening of said second end; at least one chamber defined in said diffuser body wall and having a volume at least sufficient to cause sinking or flotation of said diffuser when said chamber is filled with liquid or gas, respectively; means for filling said chamber with liquid for sinking purposes or with gas for flotation purposes; means for movably supporting said diffuser downstream of said power hydroelectric plant; said supporting means including two sets of substantially coplanar rollers mounted one set on each side of said hollow body; and two supporting surfaces positioned downstream of said power plant so that said rollers can be made to rest on said surfaces and rolled therealong towards and away from said power plant during mounting or dismounting of said diffuser, respectively.

4,073,147

WATER GATE CONTROL SYSTEM

Takeshi Nomura, 192, Yanagihara, Oyabe, Toyama, Japan

Filed Sept. 8, 1976, Ser. No. 721,298
Claims priority, application Japan, Sept. 18, 1975, 50-113241; May 7, 1976, 51-52464
Int. Cl.[2] E02B 7/46
U.S. Cl. 61—26 11 Claims



1. A water gate control system comprising

a gate installed across a water-way for swinging motion between a first position where said gate is held upright to prevent the flow of water in said water-way and a second position where said gate is held down toward the downstream side to permit the flow of water through the gate,

a hydraulic cylinder comprising a cylinder block, a piston slidably fitted into said cylinder block and a piston rod formed integral with or joined to said piston, the free end of said piston rod being pivoted to said gate, said hydraulic cylinder comprising a double-acting hydraulic cylinder wherein a spring is loaded in either of two chambers defined by said piston in said cylinder block for biasing said piston in the direction in which said gate is swung to and held in said first position,

first gate control means for resiliently loading said piston in said hydraulic cylinder in such a way that said gate is held in said first position when the level of water in said water-way on the upstream side of said gate is lower than a predetermined level and said gate is automatically fallen down toward said second position when the level exceeds said predetermined level,

second control means including a high pressure hydraulic control circuit for selective hydraulic communication with said hydraulic cylinder for actuating the same, thereby swinging said gate to and holding it at any desired angular position between said first and second positions irrespective of the level in said water-way,

change-over means for bringing said hydraulic cylinder under control with either of said first or second gate control means,

a working oil storage chamber,

a pump for pumping the working oil from said working oil storage chamber and pressurizing the working oil,

a high pressure line with one end communicated with the discharge port of said pump,

a drain line with one end communicated with said working oil storage chamber,

first and second hydraulic lines with one ends communicated with first and second ports, respectively, of said double-acting hydraulic cylinder,

a first selector valve for selectively communicating the other end of said first hydraulic line with the other end of either of said high pressure line or said drain line while communicating the other end of said second hydraulic line with the other end of either said drain line or said high pressure line, and

first and second bypass lines communicating said first and second ports of said double-acting hydraulic cylinder with said working oil storage chamber, and

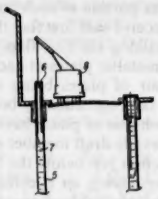
a second selector valve for opening or closing said first and second bypass lines.

4,073,148

PRECAST ELEMENT FOR THE CONSTRUCTION OF TRENCHED STRUCTURES AND THE PROCESS RELATED THERETO

Luigi Zaretti, Milan, Italy

Filed Nov. 12, 1975, Ser. No. 631,088
Claims priority, application Italy, Nov. 12, 1974, 29319/74
Int. Cl.[2] E01G 4/02
U.S. Cl. 61—42 12 Claims



1. Precast reinforced concrete element for trench construction of structures such as retaining walls and tunnels comprising:

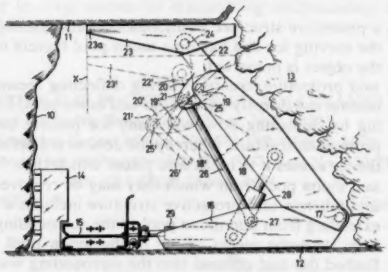
a generally rectangular-shaped wall with at least one of its faces having essentially parallel ribs extending outwardly from the surface of the wall and defining separate volume areas between the base of the wall, the two adjacent ribs and a plane tangent to the outer extension of each rib, said ribs being spaced apart to permit the pouring of liquid concrete down between adjacent ribs for the foundation of said element below said element and to permit the pouring of concrete in between the ribs to provide lateral support for the wall by filling said volume areas.

4,073,149

MINE ROOF SUPPORT ASSEMBLIES

Hans Kauter, Lunen, Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Wethmar bei L unen, Germany

Filed Dec. 3, 1975, Ser. No. 637,329
Claims priority, application Germany, Dec. 18, 1974, 2459792
Int. Cl.[2] E21D 15/44
U.S. Cl. 61—45 D 5 Claims



1. A mine roof support assembly comprising: a stowage shield; a floor sill structure for resting on the floor of a mine working; means for pivotably connecting said stowage shield to said floor sill structure; a hydraulic piston and cylinder unit connected between said stowage shield and said floor sill structure and serving to pivot said stowage shield in relation to said floor sill structure, said unit being arranged in an inclined position; a roof bar engageable on the roof of the mine working

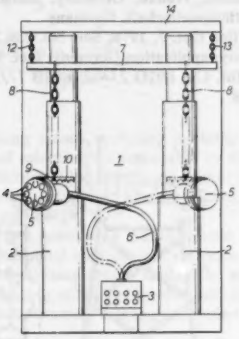
and displaceable in relation to the roof when said stowage shield is pivoted; and mechanical linkage means interposed between said roof bar and both said stowage shield and said floor sill structure for ensuring that a front end of said roof bar remote from said shield moves along a substantially vertical line when said shield is pivoted.

4,073,150

SUSPENDED VALVE CONTROL DEVICE

Josef Welzel, Wuppertal, Germany, assignor to Hermann Hemscheidt Maschinenfabrik, Germany

Filed May 18, 1977, Ser. No. 798,004
Claims priority, application Germany, May 22, 1976, 2623031
Int. Cl.[2] E21D *15/00*
U.S. Cl. 61—45 D **4 Claims**



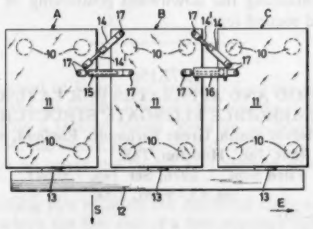
1. An assembly comprising a hydraulic walking mine-roof support frame, a multiple valve control device suspended on said frame, working fluid valves fixed on said frame, a fluid pipe-line connecting said control device to said working valves, a bar carried on the walking mine-roof support frame, a flexible supporting means on said bar for suspending the control device from said bar, a balance beam on said control device, and a line or recesses in the balance beam, said flexible supporting means being releasably fastened in any desired one of said line of recesses.

4,073,151

MINE ROOF SUPPORT ASSEMBLIES

Gunter Harmsma, Bergkamen-Overberge, Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Lunen, Germany

Filed Jan. 24, 1977, Ser. No. 761,727
Claims priority, application Germany, Feb. 5, 1976, 2604316
Int. Cl.[2] E21D *15/44*
U.S. Cl. 61—45 D **8 Claims**



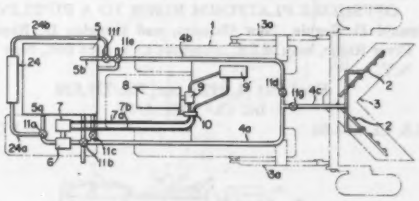
1. Apparatus for guiding and aligning three adjacent units of a mine roof support assembly, the units each comprising a floor sill and a roof cap interconnected by telescopic props, the units being displaceable by shifting ram means, the apparatus comprising first and second pairs of telescopic guide rods, the first pair of guide rods being pivotally connected, by joints, to the units of one pair of adjacent units, and the second pair of guide rods being pivotally connected, by joints, to the units of the other pair of adjacent units, wherein each guide rod of the first pair of guide rods is constituted by a springless, non-hydraulic piston-and-cylinder device and a first of the guide rods of the second pair of guide rods is constituted by a springless, non-hydraulic piston-and-cylinder device and the second guide rod of the second pair of guide rods is constituted by a double-acting hydraulic piston-and-cylinder device, and wherein the guide rods of each pair are inclined to one another at an acute angle and arranged so that the guide rods interconnecting a given pair of units are alternately retracted and extended by alternate displacement of the units of said given pair, with one of the guide rods interconnecting said given pair being completely retracted with its axis perpendicular to the direction of unit displacement when the units are arranged in a side-by-side relationship.

4,073,152

SYSTEM FOR LAYING A SUBTERRANEAN WATER IMPERVIOUS ASPHALT LAYER

Masatoshi Kishitani, Takatsuki; Yoshiteru Tamagaki, Hirakata; Takeji Matsumoto, Hirakata; Mikio Sugimoto, Hirakata, and Noriaki Namiki, Neyagawa, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 23, 1975, Ser. No. 580,353
Claims priority, application Japan, May 25, 1974, 49-59336[U]; May 27, 1974, 49-59699[U]; May 30, 1974, 49-60259
Int. Cl.[2] E02B *5/02;* A01C *23/02*
U.S. Cl. 61—63 **7 Claims**



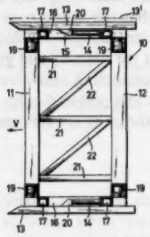
1. In a system for strewing liquidized asphalt mounted on a tractor to lay a subterranean water impervious asphalt layer which includes an engine of the tractor, a liquidized asphalt supply tank, a subterranean plough mounted on the rear side of the tractor body and provided therein with a plurality of outlet ports for discharging liquidized asphalt, a liquidized asphalt supply pipe connected between the liquidized asphalt supply tank and the outlet ports, a liquidized asphalt supply pump provided in the liquidized asphalt supply pipe and a hydraulic motor connected to the liquidized asphalt supply pump for driving the same when the hydraulic motor is energized so as to pump out liquidized asphalt from the liquidized asphalt supply tank through the liquidized asphalt supply pipe to the outlet ports causing liquidized asphalt to be discharged through the outlet ports during the movement of the tractor, thereby permitting a water impervious asphalt layer to be formed into a subterranean cavity, the improvement comprising a hydraulic pump driven by the main engine of the tractor and connected to the hydraulic motor through hydraulic lines for energizing the same and a switching valve provided in the hydraulic lines, thereby permitting the hydraulic motor to be driven in the forward or reverse direction as well as to be held in standstill position together with the liquidized asphalt supply pump by the actuation of the switching valve.

4,073,153

DRIVE SHIELDS FOR TUNNELLING

Dieter Stuckmann, Selm, and Hans Jutte, Dortmund-Brechten, both of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Germany

Filed Oct. 19, 1976, Ser. No. 733,887
Claims priority, application Germany, Oct. 21, 1976, 2547021
Int. Cl.[2] E21D *19/00*
U.S. Cl. 61—85 **7 Claims**



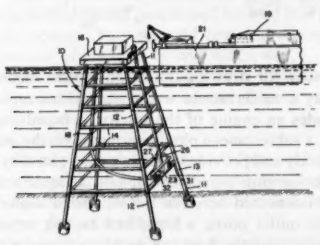
1. A drive shield for use in tunnel driving operations, comprising: a plurality of laterally adjacent support devices carried on an inner frame structure, said support devices being fixed relative to said inner frame structure against movement in the tunnel driving direction; bracing means for individually displacing said support devices relative to said inner frame structure in a direction transverse to the tunnel driving direction; a plurality of drive members mounted on each of said support devices; and shifting means for individually reciprocating said drive members relative to their respective support devices in the tunnel driving direction.

4,073,154

APPARATUS AND METHOD FOR CONNECTING AN OFFSHORE PLATFORM RISER TO A PIPELINE

Ronald D. Seguin, New Orleans, and Douglas D. Raymond, River Ridge, both of La., assignors to Texaco Inc., New York, N.Y.

Filed Oct. 4, 1976, Ser. No. 729,520
Int. Cl.[2] F16L *1/00*
U.S. Cl. 61—86 **3 Claims**



1. In a marine structure adapted to be anchored to the floor of a body of water and having a product carrying riser depending therefrom through which a fluid is passed to or from a pipeline at said floor to the water's surface,

a substantially upstanding leg structure of sufficient length to extend from the ocean floor and having bracing means attached thereto,

said product carrying riser member depending from said leg structure, and having one end terminating at the lower end of the latter,

a pipe extension member having an elongated conduit extending from said platform lower end, to a point beyond the water's surface when said extension member is disposed in an upright disposition,

means forming a product carrying flexible joint communicating said riser lower end, with said pipe extension element a first member fixed to said platform, and a second member rotatably engaging said first member, said second member being pivotally movable about a horizontal axis which extends through said first member, whereby to permit controlled pivotal movement of said extension member from its upright position, to a resting position adjacent the ocean floor, and

joint protection means operably depending from said platform supportably engaging said pipe extension member, being pivotal about said horizontal axis.

4,073,155

SEA PLATFORM CONSTRUCTION

Peter Schiemichen, Hunxe, Germany, assignor to Deutsche Babcock Aktiengesellschaft, Germany

Filed Oct. 7, 1976, Ser. No. 730,296
Claims priority, application Germany, Oct. 9, 1975, 2545219
Int. Cl.[2] F02D *23/02;* **E02B** *17/08*
U.S. Cl. 61—88 **3 Claims**

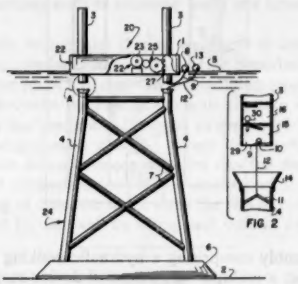


FIG. 2

1. A sea platform adapted to rest on the sea floor, comprising a first part comprising a platform, a plurality of first legs extending through said platform, an elevating mechanism connected to said first platform and said legs for raising and lowering said legs relative to said platform, a second part comprising a floatable and ballastible base adapted to be flooded to sink in the water so as to rest on the sea floor, a plurality of second legs corresponding in number and relative location to said first legs connected to said base and extending upwardly therefrom, each of said second legs having a compartment adjacent the top thereof opening upwardly which is of a size to receive a respective one of said first legs therein in telescopic interengagement, said first legs including a working chamber at the lower end thereof opening downwardly into the sea and a lock above said working chamber for access to the working chamber, said working chamber having a compressed air connection thereto to pressurize said chamber to force the water therefrom for controlling the downward positioning of said first legs into said second legs.

4,073,156

METHOD AND APPARATUS FOR LAYING A SUBMERGIBLE ELONGATE STRUCTURE

Leif Franz Halvor Smith, Great Yarmouth, England, assignor to Brown & Root, Inc., Houston, Tex.

Filed Sept. 7, 1976, Ser. No. 720,641
Int. Cl.[2] F16L *1/00*
U.S. Cl. 61—107 **9 Claims**

1. Apparatus for laying a submergible elongate structure upon a bed of a body of water comprising:

a floating vessel having a deck defining a path along which a submergible elongate structure is movable relative to said deck, said path including an assembly region in which additional submergible elongate structure can be assembled from components;

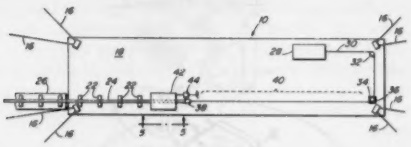
first tensioning means connected to said deck and selectively

connectable to a submergible elongate structure to be laid for applying an axial tension to the submergible elongate structure while said floating vessel is being advanced along a desired laying route, said first tensioning means including

a winch mounted on the deck of said floating vessel,

a connector for engaging an end of said submergible elongate structure,

a cable system linking said connector to said winch, said cable system disposed such that said connector is movable along said path substantially throughout the entire length of said assembly region;



second tensioning means including a clamp connected to said deck and selectively connectable to the submergible elongate structure at location along said path downstream of said assembly region and a barge anchor winch system for moving said barge;

whereby said first tensioning means enable payout under tension of assembled submergible elongate structure and said second tensioning means enable the maintenance of tension on existing submergible elongate structure while additional such structure is being assembled in said assembly region.

4,073,157

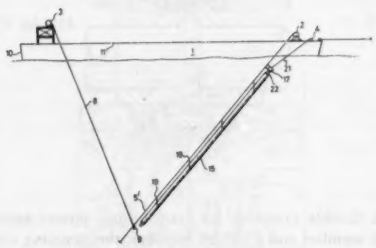
OFFSHORE METHOD

Norman Noel Aylmer, Cherhill, near Calne; Peter Coe; John Graham Watson, both of London, and Brian Percy Holloway, Epsom, all of England, assignors to Piccal Subsea Limited, London, England

Filed Oct. 26, 1976, Ser. No. 735,543

Int. Cl.[2] F16L *1/04*

U.S. Cl. 61—111 **5 Claims**



1. A method of laying out lengths of subsea pipline in sequence on the sea bed by lowering the lengths severally to the sea bed from a surface vessel down an anchored cable suspended from the vessel, said anchored cable being wound on a first winch on board the vessel, said method comprising the steps of:

(a) attaching to a point on the anchored cable adjacent said first winch the free end of a first auxiliary cable which is wound up on a second winch horizontally separated from the first winch by at least a distance substantially equal to a length of the pipe to be laid;

(b) paying out anchored cable from the first winch while winding said first auxiliary cable on the second winch, to move said point of attachment along the vessel for a distance equal to said length of pipe to be laid;

(c) hanging along the anchored cable between said point and the first winch travelling supports carrying the length of pipe to be laid and attaching to the length of pipe a second auxiliary cable wound up on a third winch;

(d) paying out the first auxiliary cable and thereby lowering to a position hanging from the first winch, the anchored cable with the length of pipe supported therealong above said point of attachment;

(e) detaching the first auxiliary cable from the anchored cable and then paying out the second auxiliary cable, thereby lowering said supported length of pipe down the anchored cable to a position adjacent the anchor point or the next previously lowered length of pipe in the sequence;

(f) repeating steps (a) to (e); and moving the vessel forward along the direction of the pipeline for a distance equivalent to the lengths of pipe laid.

4,073,158

APPARATUS FOR FREEZING SMALL DROPS OF LIQUID

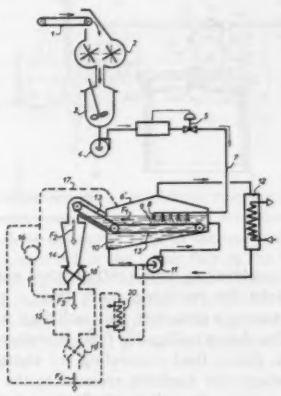
Jacques Guiller, Rue de France, Ansouis, France

Filed Nov. 4, 1975, Ser. No. 628,785

Claims priority, application France, Nov. 7, 1974, 74 37010; Mar. 13, 1975, 75 07868; Sept. 30, 1975, 75 29923

Int. Cl.[2] F25C *1/00*

U.S. Cl. 62—266 **4 Claims**



1. An apparatus for the conversion of a mass of non-gaseous fluid product to deep-frozen balls or granules, said apparatus comprising:

a deep-freeze chamber rendered fluid-tight, in which a refrigerant liquid is contained under the physical conditions of passage to the gaseous state;

an injector system for injecting said fluid product under pressure into said refrigerant liquid;

an extractor-conveyor for the deep-frozen balls or granules obtained in said refrigerant liquid;

an outlet lock-chamber permitting the evacuation of the deep-frozen products without adversely affecting the fluid-tightness;

means for regulating the flow-rate of said injector system, said means being put into service in order to produce an appropriate over-pressure in the interior of said deep-freeze chamber.

2. An apparatus for converting a mass of non-gaseous fluid product to deep-frozen balls or granules, said apparatus comprising:

a deep-freeze chamber rendered fluid-tight in which a refrigerant liquid is contained under the physical conditions of passage to the gaseous state;

an injector system for injecting said fluid product under pressure into said refrigerant liquid;

an extractor-conveyor for the deep-frozen balls or granules obtained in said refrigerant liquid;

an outlet lock-chamber permitting the evacuation of the deep-frozen products without adversely affecting the fluid-tightness;

means for regulating the flow-rate of said injector system, said means being put into service in order to produce an appropriate over-pressure in the interior of said deep-freeze chamber;

an expansion chamber arranged following said outlet lock-chamber and said deep-freeze chamber on over-pressure, connected to means for recovery of said quantity of refrigerant fluid impregnating said deep-frozen products passing out of said deep-freeze chamber.

4,073,159

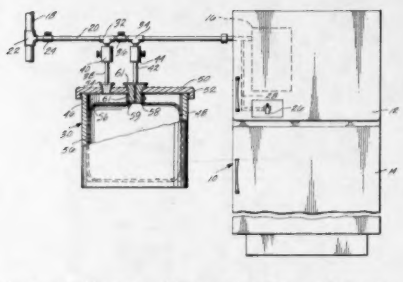
BYPASS DISPENSER UNIT FOR AUTOMATIC ICE MAKER

Anthony C. Trippi, 900 Fallen Leaf Road, Arcadia, Calif. 91006

Filed July 23, 1976, Ser. No. 708,085

Int. Cl.² F25C *1/00*

U.S. Cl. 62—340 **2 Claims**



2. In combination with a refrigeration unit having a water supply inlet for receiving water from a pressurized water supply source, a dispenser unit including means providing a sealed chamber, a collapsible fluid container positioned in the chamber, means fluid connecting the chamber to the water supply source for applying pressure to the container, means fluid connecting the collapsible fluid container to the inlet of the refrigeration unit, and mixing valve means connecting fluid from the supply mixed with fluid from the container to the inlet of the refrigeration unit.

4,073,160

TORQUE TRANSMITTING COUPLING

Claude Perret, Belley, France, assignor to Cefilac, Paris, France

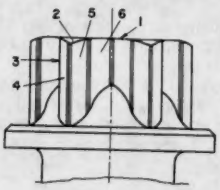
Filed Aug. 3, 1976, Ser. No. 711,353

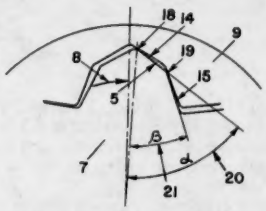
Claims priority, application France, Aug. 14, 1975, 75 25954

Int. Cl.² F16D *1/00*; B25B *13/00*

U.S. Cl. 64—9 R **6 Claims**

1. A high performance torque transmitting coupling including a drive element and a driven element, one of said elements having at least two teeth symmetrical in relation to the axis of rotation of the corresponding element and having generatrices parallel to this axis, the second element having at least two sockets symmetrical in relation to the axis of rotation of the corresponding element and having generatrices parallel to this axis, said teeth and sockets each being constituted by flat surfaces symmetrical in relation to their bisecting plane and connected by curved surfaces, characterized in that each tooth and socket is provided with at least four flat surfaces, each tooth being engageable with one of said sockets and, when engaged, providing at least two spaced drive generatrices for a given





direction of rotation, the drive generatrices having at least two different angles of attack.

4,073,161

FLEXIBLE COUPLINGS

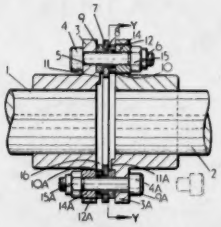
Norman Albert Bury, Warrington, England, assignor to Flexibox Limited, Manchester, England

Filed June 3, 1976, Ser. No. 692,392

Claims priority, application United Kingdom, June 4, 1975, 24032/75

Int. Cl.² F16D *3/78*

U.S. Cl. 64—13 **2 Claims**



1. A flexible coupling for transmitting power between a driving member and a driven member, the coupling comprising:

a first transmission member connectable with the driving member;

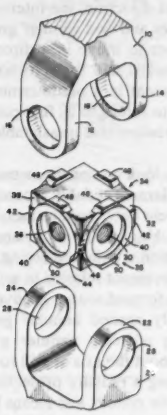
a second transmission member connectable with the driven member and axially spaced from the first transmission member;

a flexible element sub-assembly disposed between the first and second transmission members and drivingly interconnecting them, the sub-assembly comprising a pack of flexible membranes formed adjacent to, but inwardly of their peripheral edges with equi-angularly spaced holes, a sleeve extending through each hole and having a flange abutting one face of the pack of flexible membranes; and

a spigot on each first and second transmission member projecting towards and axially spaced from the other respective transmission member, each spigot having a collar and each being located in such disposition on the transmission

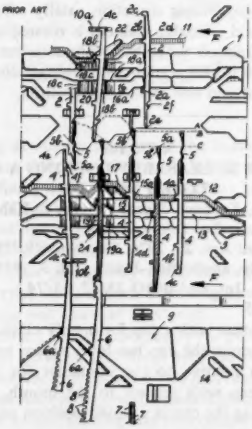
member that it peripherally contacts the adjacent collar of the other transmission member with an outwardly-directed force to thereby deform the flexible membranes to a predetermined amount.

4,073,162
THRUST WASHER STRIP
James George DeBisschop, Thomaston, Conn., assignor to The Torrington Company, Torrington, Conn.
Filed Aug. 2, 1976, Ser. No. 710,624
Int. Cl.[2] B65D *73/02*; F16B *39/28*; F16D *3/33*
U.S. Cl. 64—17 R **6 Claims**



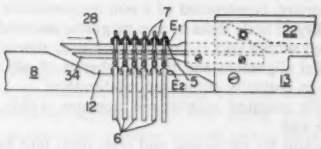
1. A plastic thrust washer strip comprising: a plurality of integral interconnected plastic washers; and at least one tab on a washer at one lateral side of the strip and at least one tab on a washer at the other lateral side of the strip for locating said washer strip on the hub of a universal joint.

4,073,163
CIRCULAR KNITTING MACHINE
Francesco Lonati, via Valsorda, 28, Brescia, Italy
Filed Nov. 8, 1976, Ser. No. 739,930
Int. Cl. D04b *9/10, 15/08*
U.S. Cl. 66—14 **3 Claims**



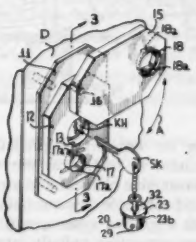
1. A double-cylinder circular knitting machine having latch needles and a safety device for the opening of the needle latches, comprising needles to be transferred from one of the two needle cylinders to the other thereof and needles not to be transferred, a transfer area, transfer members facing each other within the two needle cylinders and having control butts, each of said needles engaging a corresponding one of said transfer members, and control cams for said butts of said transfer members defining at least a first track for the butts of the transfer members associated with said needles to be transferred and at least a second track for the butts of the transfer members associated with said needles not to be transferred, and further comprising an auxiliary cam located upstream of said transfer area and configurated to bring the butts of the transfer members of one of said needle cylinders which are guided in said second track out of said second track and the corresponding needles to a height level of contact with the respective facing transfer members of the other of said needle cylinders, thereby providing a gradual opening of the needle latches by said facing transfer members, and a subsequent cam configurated to bring the butts of the transfer members associated with said needles not to be transferred back to said second track.

4,073,164
GLOVE KNITTING APPARATUS
Masahiro Shima, Wakayama, Japan, assignor to Shima Idea Center Company Ltd., Wakayama, Japan
Filed Sept. 30, 1976, Ser. No. 728,440
Claims priority, application Japan, Oct. 4, 1975, 50-120060
Int. Cl.[2] D04B *7/34*
U.S. Cl. 66—65 **1 Claim**



1. A loop support device for a flat knitting machine comprising a plate-like main loop support which is provided with a notch extending along the upper edge in the one end portion thereof and is mounted below the lower face of the hooks of needles to be slid along the row of the hooks of needles, and a plurality of rod-like auxiliary loop supports which are disposed to be adjacent to the notch and parallel to the upper edge of the main support and which may be projected slidably toward the notch independently.

4,073,165
LOCKING DEVICE FOR KEYHOLES
Robert Ronnie Grundstrom, 452 Ave. V, Brooklyn, N.Y. 11223, and Arthur Baylis, 156 West End Ave., Brooklyn, N.Y. 11235
Filed Aug. 6, 1976, Ser. No. 712,203
Int. Cl.[2] E05B *11/00, 17/14*
U.S. Cl. 70—371 **16 Claims**



1. A security locking device for a keyhole and the like com-

prised of a base plate, means adapted to secure the plate about the keyhole, an opening in the plate adapted to be aligned with the keyhole, a cover plate, means mounting the cover plate to the base plate to selectively cover and uncover the opening, means locking the cover plate to the base plate, said locking means including aligned openings disposed in each of said plates, a locking cylinder disposed in said opening, at least one locking pin disposed in said cylinder, means mounting said one pin for movement into and out of the cylinder and actuating means controlling said mounting means for moving said pin.

4,073,166

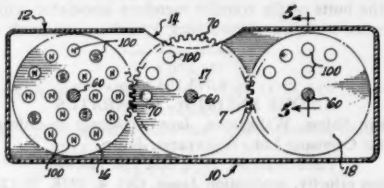
MAGNETIC LOCK PICK

William H. Clark, 16521 Queenside Drive, Covina, Calif. 91722

Filed Jan. 3, 1977, Ser. No. 756,080

Int. Cl.[2] E05B *19/20*

U.S. Cl. 70—394 **10 Claims**



1. A lock pick for opening magnetically operated locks and their like, comprising:

an enclosure, constructed of a non-magnetizable material;

a plurality of code disks of non-magnetic material, rotatably housed within said enclosure, with their rotational axes in parallel alignment and the peripheries of adjoining code disks in mutually entraining relationship;

randomly oriented magnetized domains within said code disks; and

drive means for entraining said code disks into simultaneous rotation, whereby a randomly structured, varying magnetic field is created external to said enclosure.

4,073,167

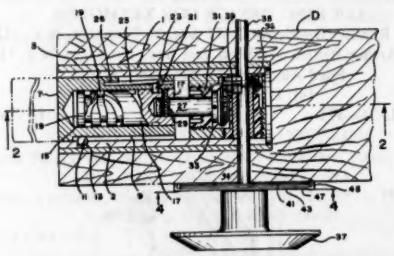
MECHANISM FOR CONVERTING PREDETERMINED ALTERNATE ROTATIONAL MOVEMENTS TO RECTILINEAR MOVEMENTS

Charles F. Bates, II, 18 St. Andrews Drive, Ladue, Mo. 63124

Filed Feb. 19, 1976, Ser. No. 659,499

Int. Cl.[2] E05B *37/00, 37/20;* **F16H** *25/12*

U.S. Cl. 70—133 **39 Claims**



1. Mechanism for converting predetermined alternating rotational movement to rectilinear movement comprising a translatable non-rotatable element and a rotatable non-translatable element, said rotatable element having a cylindrical surface formed with a groove system, said translatable element having a follower projecting radially into said groove system and having a first position at one end thereof, said groove system comprising a plurality of axially spaced annular grooves and first oblique grooves respectively intersecting adjacent annular grooves, whereby translational movement of said translatable element in one direction away from said first position is achieved by alternate rotational movements of said rotatable element in opposite directions in accordance with the rotational positions of the intersections between said annular and said first oblique grooves, the intersections between said annular and said first oblique grooves being formed to permit only movements in an axial direction away from said first position of said follower from said annular grooves into said first oblique grooves and from said first oblique grooves into said annular grooves, and additional oblique grooves connecting adjacent annular grooves and each extending therebetween in the same rotational direction, the intersections of said additional oblique grooves and said annular grooves being formed to cause said follower to move in a direction axially of said rotatable element toward said first position whereby rotation of said rotatable element in a predetermined single direction causes said follower to return to its first position in said groove system and thereby restore said translatable member to its first position.

15. A combination lock comprising a casing having an elongated recess, a bolt element slidably mounted in said casing for axial movement therein between a retracted unlocked position and a projected locking position, means holding said bolt element against rotation within said casing, a rotatable element held against axial movement relative to said casing and having a cylindrical surface formed with a groove system comprising a plurality of axially spaced annular grooves and oblique grooves intersecting adjacent annular grooves at positions angularly disposed about the axis of said rotatable element, said bolt element mounting a radially projecting follower slidably fitting into said groove system, and means for selectively rotating said rotatable element alternately in opposite directions in accordance with the intersections of said annular and said first oblique grooves whereby to cause said follower in cooperation with said grooves to move said bolt element axially from projected toward retracted position with respect to said casing, the intersections between said annular and said first oblique grooves being formed to permit movements only in bolt-retracting axial direction of said follower from said annular grooves into said first oblique grooves and from said first oblique grooves into said annular grooves, additional oblique grooves connecting adjacent annular grooves and each extending therebetween in the same rotational direction, the intersections of said additional oblique grooves and said annular grooves being so formed and located to cause said follower to move in a bolt-projecting direction axially of said grooved element when said rotatable element is rotated in a predetermined single direction whereby continuous rotation of said rotatable element in said predetermined single direction causes full projection of said bolt to locking position.

4,073,168

DEVICE FOR RELEASABLY LOCKING A CAP ON A CLOSED POSITION

Shinichi Takada, Koyama, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Apr. 23, 1976, Ser. No. 679,778

Claims priority, application Japan, Oct. 3, 1974, 49-118896

Int. Cl.[2] B65D *55/12, 55/14*

U.S. Cl. 70—165 **3 Claims**

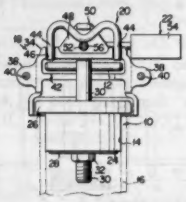
1. In combination with a cap for openly closing a mouth of a container, wherein the cap has lever means to be turned in either direction relative to the container for tightening or loosening the cap with respect to the mouth, a device for releasably locking the cap in a closed position on the mouth of the container, comprising:

a cap cover loosely fitted over said cap and enclosing said lever means, said cap cover having a pair of lugs extending upwardly therefrom;

means on said cap cover for preventing detachment thereof

from said cap while permitting said cap cover to be turned relative to said cap;

a pin slidably supported by said cap cover for movement between a first position, where said pin is held out of engagement with said lever means of said cap to permit said cap cover to be turned relative to said cap, and a second position, where said pin engages said lever means of said cap to permit said cap cover to be turned with said



cap; said lugs being arranged on opposite sides of said pin and being substantially interconnected at their top ends to provide stop means on said cap cover for preventing detachment of said pin from said cap cover; and

lock means for locking said pin in said first position;

whereby said cap is loosenable via said cap cover only when said lock means is released to move said pin to said second position.

4,073,169

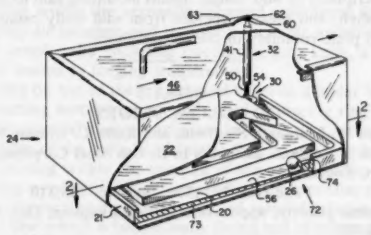
BALL-OPERATED LABYRINTHIC LOCK

Lyle C. Nelson, 1928 Cooper Plaza, Bend, Oreg. 97701

Filed July 21, 1976, Ser. No. 707,294

Int. Cl.[2] B65D *55/02;* **E05B** *37/20*

U.S. Cl. 70—166 **7 Claims**



1. A locking device for preventing the unauthorized release of locking means associated therewith, said device comprising:

a. means defining a labyrinthic passageway having a starting end and a finish end;

b. a ball residing in said labyrinthic passageway means and movable therethrough;

c. said labyrinthic passageway means defining a ramp over at least a portion of its extent, extending upwardly between said starting end and said finish end;

d. means defining a reset passageway for permitting passage of said ball between said finish end and said starting end without reversely negotiating said labyrinthic passageway means, said reset passageway means interconnected at one of its ends to said starting and interconnected medially to said finish end;

e. locking means associated with the other end of said reset passageway means, releasable in response to the adjacent presense of said ball at said other end of said reset passageway.

4,073,170

REMOTELY ACTUATED LOCK ARRANGEMENT FOR MOTOR VEHICLE

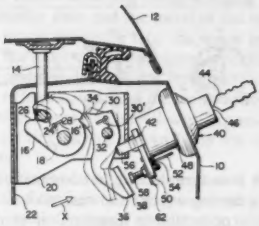
Yoshiyuki Miyabayashi, Tokyo, and Yoshimasa Tsuchiya, Sayama, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Jan. 30, 1976, Ser. No. 653,902

Claims priority, application Japan, Jan. 31, 1975, 50-13005

Int. Cl.[2] E05B *65/12*

U.S. Cl. 70—256 **2 Claims**



1. In a motor vehicle:

a passenger compartment;

a luggage compartment with a lid;

a casing secured within said luggage compartment;

a latch pivotably supported by said casing and having a latched position for securing said lid and an open position for releasing said lid;

a detent pivotably supported by said casing and operable in one position thereof to retain said latch in the latched position;

first spring means for biasing said latch toward an unlatched position from said latched position;

second spring means for biasing said detent toward said one position thereof;

finger means coactive with said detent in a first position thereof and manually operable from the outside of the motor vehicle to move said detent to release said latch, said finger means being movable between the first position thereof and a second position thereof in which said finger means is out of coactive condition with said detent;

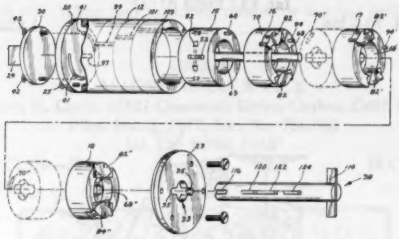
key operable means for moving said finger means between the first and second positions thereof, said key operable means being operable by a key from the outside of the motor vehicle, said key operable means including a swingable arm carrying said finger means, means for toggle operating said arm and first and second stop means fixed with respect to said arm, said first stop means being operative for limiting swingable movement of said arm to define the first position of said finger means, said second stop means being operative for limiting swingable movement of said arm to define the second position of said finger means;

control means for moving said finger means between the first and second positions thereof, said control means being manually operable from said passenger compartment, said control means including a link plate operatively connected to said arm and a manually operable part extending into said passenger compartment, said manually operable control means being operable by said manually operable part to move said arm between said first and second stop means.

4,073,171
LOCK STRUCTURE

John H. Moorhouse, Clear Lake, Minn. 55319

Filed Sept. 11, 1975, Ser. No. 612,306
Int. Cl.[2] E05B *29/02*
U.S. Cl. 70—366 7 Claims

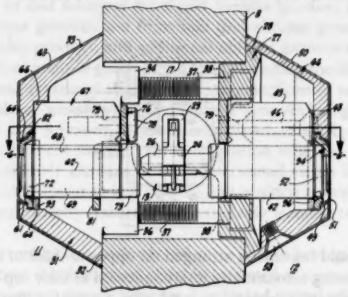


1. A lock structure, having in combination
a housing having a front and rear wall,
a plurality of rotatable members in abutting relationship disposed in said housing,
said front wall and said rotatable members defining a key-way there through,
an arcuate slot through said rear wall,
means disposed through said slot secured to the rotatable member adjacent said rear wall limiting the maximum rotation of movement of said rotatable member into an operating position,
means inter-connecting said rotatable members permitting limited relative rotation of movement of each of said members and in a predetermined sequence causing said rotatable members to progressively move one another until all move unitarily,
each of said rotatable members having one or more tumblers pivoted therein,
said tumblers respectively holding said rotatable members in non-rotatable locked position,
said rotatable members being rotationally positioned in a staggered relation relative to one another to have said tumblers misaligned in an operating direction relative to a common axis,
each of said rotatable members having a bore and a counter bore,
said tumblers being pivotally carried by each of said rotatable members and being mounted therein to project into the counter bore thereof, said counter bores each having a predetermined length, said tumblers respectively having a cam surface extending into said counter bore and having a portion thereof lockingly engaged in said housing,
each of the bores of said rotatable members having a predetermined length,
a key disposed in said key-way, said key having aligned projecting lands,
said key-way defining a slot in said bores, each of said slots having a length equal to the diameter of the counter bore adjacent thereto,
said lands on said key being spaced apart the length of the respective bores of said rotatable members, and
said key being positioned within said key-way to have each land thereof within a respective counter bore and the height of each land being such as to respectively engage the adjacent cam surface of its respective tumbler in said counter bores to pivot and release said tumbler from locking engagement with said housing for the respective rotation of said rotatable members by rotative movement of said key.

4,073,172
HIGH SECURITY DEADBOLT LOCK

Ernest L. Schlage, Burlingame, Calif., assignor to Schlage Lock Company, San Francisco, Calif.

Filed June 7, 1976, Ser. No. 693,191
Int. Cl.[2] E05B *15/16*
U.S. Cl. 70—417 3 Claims

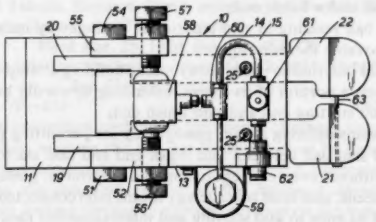


1. A high security lock for use with a door panel comprising a shell having a surface adapted to engage said panel and having a front wall, means defining a substantially circular hole through said front wall, an interior cylindrical counterbore in said front wall larger than said hole and concentric thereto, a lock body in said shell and having a planar end face and a circular-cylindrical bore therein concentric to said hole, a circular-cylindrical plug rotatable in said bore, a flange on one end of said plug abutting said end face and smaller than said hole to leave a space therebetween, means defining a keyway in said plug, said keyway having an edge opening radially through said flange to leave an edge notch therein, a circular guard plate larger than said hole rotatably mounted in said counterbore, said guard plate having a key-receiving opening therethrough and overlying said plug, a tab on said guard plate near the periphery thereof and disposed in said edge notch at the periphery of said flange, means mounting said lock body in said shell, and means separate from said body retaining said guard plate rotatably in said counterbore.

4,073,173
ROLLER GUIDES

Joseph W. Marshall, Sheffield, and Keith C. Gibson, Kingston, both of England, assignors to British Steel Corporation, London, England

Filed Oct. 18, 1976, Ser. No. 733,310
Claims priority, application United Kingdom, Oct. 17, 1975, 42740/75
Int. Cl.[2] B21B *39/14*
U.S. Cl. 72—250 11 Claims



11. A roller guide assembly for guiding a workpiece into a roll pass of a rolling mill which comprises a rigid housing, guide rollers operable to engage the workpiece and to guide it into the roll pass of the mill and comprising a pair of rotatable

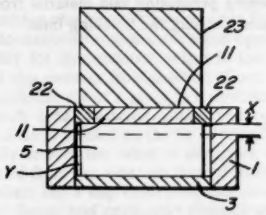
guide rollers mounted at the exit end of the housing and reaction means operable to transmit a substantially constant load to the workpiece through each guide roller of the assembly irrespective of any lateral displacement of the rollers by the workpiece.

4,073,174

PROCESS OF FORGING LARGE SEAMLESS FERROUS-METAL WELDING NECKS AND OTHER CYLINDRICAL ARTICLES

Charles H. Moore, 645 Matanzas Court, Fort Myers Beach, Fla. 33931

Continuation-in-part of Ser. No. 519,043, Oct. 29, 1974, abandoned. This application Jan. 19, 1976, Ser. No. 650,001
The portion of the term of this patent subsequent to Nov. 22, 1994, has been disclaimed.
Int. Cl.[2] B21C *23/00, 23/01, 23/20, 35/04*
U.S. Cl. 72—254 **3 Claims**



1. A process for forging large heavy-duty seamless, high-pressure resistant, self-reinforcing ferrous-metal open-ended welding necks and the like having walls of substantial thickness in a forging press possessing the usual lower stationary element and the usual upper vertically movable element, said process including

a. placing on the lower stationary element of the forging press a vertically disposed cylindrical female forging die member provided at the bottom thereof with a removable metallic disc and a peripherally enclosing circular forging knife

b. placing within the vertically disposed cylindrical female forging die member, and atop the removable metallic disc and peripherally enclosing circular forging knife, a steel billet heated to forging temperature

c. placing on top of the heated steel billet an annular billet-contacting metal-working and metal-displacing ring having an external diameter which is less than the diameter of the bore of the cylindrical female forging die member

d. positioning within the opening of the annular billet-contacting metal-working and metal-displacing annular ring a billet-contacting metal-working and metal-displacing metallic disc which is fairly closely fitting and of substantially the same thickness as that of the annular billet-contacting metal-working and metal-displacing ring

e. disposing atop the annular metallic billet-contacting metal-working and metal-displacing ring and the metal-working and metal-displacing metallic disc a round forging press follower of a diameter which is less than the diameter of the die cavity of the cylindrical female forging die member but sufficient to cover both the metallic billet-contacting metal-working and metal-displacing metallic disc and most of the metallic billet-contacting metal-working and metal-displacing annular ring.

f. moving the upper and vertically movable element of the forging press follower onto the annular billet-contacting forging press follower onto the annular billt-contacting metal-working and metal-displacing metallic disc and the billet-contacting metal-working and metal-displacing annular ring and, through said metallic disc and said annular ring, exert forging pressure onto the top of the heated billet, whereby the billet spreads out until the outer periphery thereof makes contact with the inner surface of the die cavity of the cylindrical female forging die member

g. arresting the downward movement of the upper and vertically movable element of the forging press when the immediately aforementioned condition takes place

h. removing the aforementioned round forging press folloer and replacing it with a second round forging press follower having a diameter that is less than that of the billet-contacting metal-working and metal-displacing disc and which is concentric therewith

i. applying pressure through the upper and vertically movable element of the forging press to the top of the second-named round forging press follower, whereupon the latter depresses the billet-contacting metal-working and metal-displacing metallic disc, and the metal of the heated billet is caused to move upwardly into the space between the periphery of the billet-contacting metal-working and metal-displacing metallic disc and the inner surface of the die cavity of the cylindrical forging die member during which the annular billet-contacting metal-working and metal-displacing annular ring moves upwardly on top of the back-extruded metal

j. continuing the immediately aforementioned movements until the metal of the heated work-piece below the metal-working and metal-displacing metallic disc is no less than approximately three inches thick

k. removing the annular metal-working and metal-displacing annular ring from the top of the back-extruded work-piece formed of said heated billet

l. removing the removable disc from the bottom of the vertically disposed cylindrical female forging die member and

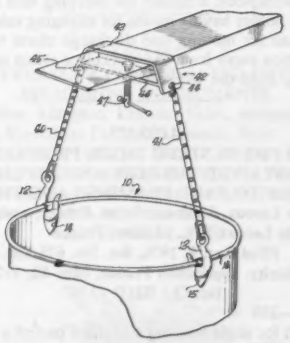
m. punching-out the aforementioned three-inch thickness of metal at the bottom of the work-piece and the billet-contacting metal-working and metal-displacing metallic disc through the hereinbefore described circular forging knife and out of the vertically disposed cylindrical female forging die member.

4,073,175

DRUM LIFTING METHOD AND DEVICE

Paul Seamon, 6191 Anthony Ave., Garden Grove, Calif. 92645

Filed Dec. 30, 1976, Ser. No. 755,595
Int. Cl.[2] B21D *31/02*
U.S. Cl. 72—325 **8 Claims**



1. An improved method for lifting metal drums of about fifty four gallon capacity with the fork of a fork lift truck of the type wherein a drum attachment fixture is affixed to the lifting fork of a fork lift truck, wherein the improvement comprises:

forming at least two reinforced openings in the side of the drum at the bottom edge of the upper lid of the drum, each of said openings being formed by a cutting member having a lever arm and a cutting arm, said lever arm fitting over the upper lid of the drum to be lifted and said cutting arm

having an indented portion having two sharpened edges terminating in a sharpened point whereby a V-shaped portion of said drum is cut and bent to form a generally V-shaped opening in the side of said drum, the wider end of the V-shaped opening having a bentover portion which forms a cushion or support for hook means; and

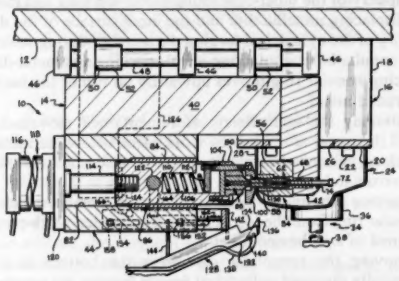
inserting at least two hook means in said openings, said hook means being supported by the fork of a fork lift truck by chain means.

4,073,176

PIERCING AND FLANGING APPARATUS

William A. Paul, 1808 Parkside Blvd., Toledo, Ohio 43607

Filed Jan. 19, 1977, Ser. No. 760,629
Int. Cl.² B21D *37/12, 45/00*
U.S. Cl. 72—328 **9 Claims**



1. Apparatus for piercing and flanging a workpiece, said apparatus comprising a support, means carried by said support for holding a workpiece, a frame carried by said support for movement along a path, a back-up die assembly, a punch assembly, said assemblies being carried by said frame with one being movable with respect thereto, a ram including a cylinder and a piston rod, one of said cylinder and rod being connected to said frame, and the other of said cylinder and said rod being connected to said movable assembly, said workpiece holding means being positioned to hold a portion of the workpiece between said punch assembly and said back-up die assembly, a discharge chute, means movably supporting said discharge chute by said frame, means for urging said discharge chute away from the portion of the frame which supports it and toward a position in which a portion of the discharge chute is below the workpiece, a holder for carrying said movable assembly, said holder having means for engaging said chute-supporting means for moving said discharge chute toward a retracted position away from the workpiece when said holder is moved away from the workpiece.

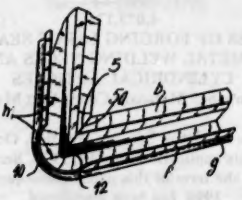
4,073,177

METHOD FOR BENDING THICK PROFILED PARTS, PART OBTAINED THEREBY AND APPLICATION THEREOF TO PANE FRAMINGS AND THE LIKE

Serge Andre Leroux, Vaux-sur-Seine, France, assignor to Etablissements Leroux S.A., Meulan, France

Filed Apr. 9, 1976, Ser. No. 675,330
Claims priority, application France, May 12, 1975, 75 14718
Int. Cl.² B21D *11/00*
U.S. Cl. 72—339 **11 Claims**

1. Method for angle bending a profiled part of a longitudinal extension and having at least one arm and a main web parallel to the longitudinal extension of the profiled part, comprising the steps of forming in said arm a notch extending on a portion of its width and substantially to said main web, said notch delimiting two segments of profiled part and having two edges making an angle substantially equal to the angle the profiled part has to be bent, and said two edges of the notch leading towards a bottom portion having a width depending on the bending angle and on the non-notched or plain thickness of the material of the profiled part, subsequently applying on the two segments of profiled part on each side of said notch a compression stress combined with a folding force, so that the material of said bottom portion of the notch tends to retract and to flow towards a side of the profiled part opposite the notch during



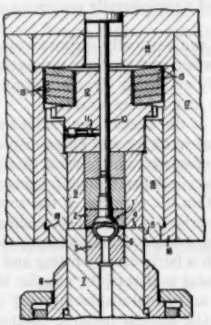
the folding to form an outer round, whereby the material of the profiled part forming the outer round is only submitted to a limited lengthening preventing said material from being submitted to stresses reaching the breaking limit.

4,073,178

DEVICE FOR COLD FORGING THE HOLLOW, SPHERICAL HEADS OF BALL-JOINT PIVOTS

Maurice Dutartre, Boulogne Billancourt, and Yves Roger, Meudon La Foret, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Aug. 26, 1976, Ser. No. 718,034
Int. Cl.² B21D *22/00*
U.S. Cl. 72—352 **4 Claims**



1. A device for the precision cold forging of hollow, spherical heads of ball-joint pivots comprising:

a pair of hemispherical forming dies closing on a joint plane passing almost through the center of the ball-joint, the pivot rod of said ball-joint pivot being maintained in one of the dies, along an axis perpendicular to the joint plane;

a tool holder providing a bearing edge situated almost on a level with said joint plane of the dies;

said die containing said pivot rod being clamped on said tool holder with one end thereof against said bearing edge;

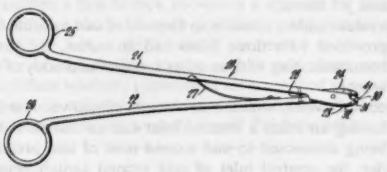
a flexible element providing a thrust against the opposite end of said die containing said pivot rod, said thrust being higher and opposite to the forming pressure created during said forging of said hollow, spherical heads and assuring that said one of said dies is permanently maintained against said bearing edge.

4,073,179

CLIP REMOVING DEVICE

Robert J. Hickey, deceased, late of Halifax, Mass., by Lisa M. Hickey, administratrix, Manomet, Mass., assignors to Codman & Shurtleff, Inc., Randolph, Mass.

Filed June 1, 1976, Ser. No. 691,271
Int. Cl.[2] B21D 7/00
U.S. Cl. 72—409 4 Claims



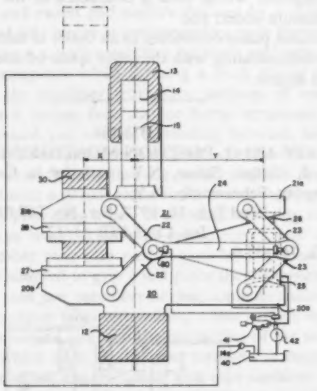
1. For use with a clip member having arms foldable about a midsection into clamping engagement about opposite sides of a tubular member for strangulation when in use, a device for removing said clip member from position of use, comprising: a pair of jaws rockable about a pivot in a direction toward and away from each other between closed and open positions, respectively; an anvil formed on the tip of one of said jaws and facing inwardly toward the other of said jaws; a shoulder on said anvil spaced from the outer tip thereof forming a stop for said clip member; and a clip deforming element on the tip of said other jaw facing said anvil, said element when said jaws are closed contacting said anvil at a location spaced outwardly from said shoulder.

4,073,180

RING FORGING APPARATUS FOR FORMING AND ENLARGING LARGE RINGS

Hans J. Pahnke, and Hans-Albert Schubert, both of Dusseldorf, Germany, assignors to Pahnke Engineering G.m.b.H. & Co. KG, Dusseldorf, Germany

Filed Mar. 24, 1976, Ser. No. 669,902
Claims priority, application Germany, Apr. 3, 1975, 2514898
Int. Cl.[2] B21J 9/12
U.S. Cl. 72—453.01 10 Claims



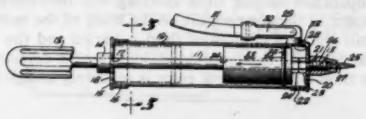
1. In combination a hydraulic press, having a frame, an anvil member and a press piston movable toward said anvil, a pair of generally parallel arms adapted to fit between said piston and anvil and be acted thereon intermediate the ends of said arms by said piston, said arms being connected by a parallel linkage maintaining said arms in generally parallel relationship, a pair of opposed work surfaces at one end of said parallel arms adapted to receive a ring to be enlarged and a compensating hydraulic cylinder between the other ends of said parallel arms acting between said ends to maintain said arms in parallel with minimum pressure on said parallel arms.

4,073,181

AUTOMOBILE BODY DENT PULLER TOOL

Eugene B. Steinmann, Jr., 9140 Fountainbleau Blvd., Apt. 402, Miami, Fla. 33172

Filed June 23, 1975, Ser. No. 589,378
Int. Cl.[2] B21D 1/12
U.S. Cl. 72—479 3 Claims



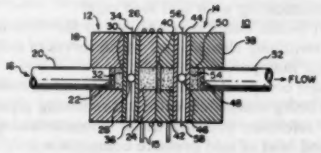
1. A pneumatically-driven auto-body dent puller comprising in combination, a slide shaft, a handle at one end of said slide shaft, means for removably securing a self-tapping screw at the other end of said slide shaft, a cylindrical slide weight having a coaxial bore through which said slide shaft is slidingly received, impact abutment means at the handle end of said slide shaft, a tubular cylinder member concentrically disposed about said slide shaft, a pair of front and rear end cap members centrally apertured for the through passage of said slide shaft and arranged thereon for enclosing the front and rear ends, respectively, of said tubular cylinder member, the outer diameter of said cylindrical slide weight being slightly less than the internal diameter of said tubular cylinder member to permit free sliding movement thereof along said slide shaft and within said tubular cylindrical member, and means for injecting a blast of pressurized air within the front end of said cylinder member forwardly of said cylindrical slide weight while in a forward position within said cylinder to drive said cylindrical slide weight rearwardly for impact against said impact abutment means through said rear end cap member, said end cap members each being provided with peripheral skirt portions slidingly receiving respective end portions of said tubular cylinder member, and vent means in said rear end cap member for discharge therethrough of air in said cylinder displaced upon said rearward driving movement of said slide weight.

4,073,182

TEMPERATURE COMPENSATED OPTICAL MEASURING INSTRUMENTS

Robert William Allington, Lincoln, Nebr., assignor to Instrumentation Specialties Company, Lincoln, Nebr.

Continuation-in-part of Ser. No. 251,712, May 9, 1972, Pat. No. 3,967,492. This application June 25, 1976, Ser. No. 699,877
The portion of the term of this patent subsequent to July 6, 1993, has been disclaimed.
Int. Cl.[2] G01K 19/00
U.S. Cl. 73—1 R 24 Claims



1. A method of reducing flow-rate-dependent errors in an instrument for measuring a characteristic of a fluid comprising the steps of:

causing a fluid to flow through said instrument;

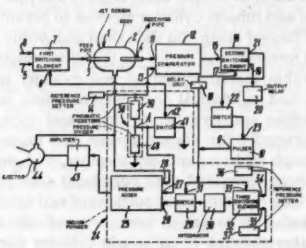
varying the rate of flow of the fluid through said instrument;
detecting the rate of change of the flow-rate-dependent error in said characteristic measurement with respect to the rate of change of the flow of fluid through the instrument; and
adjusting the flow of heat through the instrument until the flow-rate-dependent error is at a relatively low level;
the step of adjusting the flow of heat through the instrument including the step of adjusting the flow of heat until the factors that caused flow-rate-dependent increases are substantially balanced against the factors that caused flow-rate-dependent error decreases with the same magnitude of change in the flow rate of the fluid by adjusting the temperature of the fluid entering the instrument with respect to the temperature of the body of the instrument while the rate of flow of fluid is varied and the rate of change of the flow-rate-dependent error is detected until the flow-rate-dependent error is relatively low.

4,073,183

PNEUMATIC DETECTOR OF GAS AND VAPOR CONTAMINANTS IN ATMOSPHERE OF INDUSTRIAL BUILDINGS

Mikhail Vladimirovich Byalko, Studeny proezd, 38, korpus 2, kv. 388; Elena Viktorovna Kirko, ulitsa Udaltsova, 10, kv. 77; Rafael Shliomovich Perlovsky, Sirenevy bulvar, 27, korpus 2, kv. 113, and Vadim Jurievich Ryzhnev, Ryazansky prospekt, 95 korpus 4, kv. 20, all of Moscow, U.S.S.R.

Filed July 19, 1976, Ser. No. 706,791
Int. Cl.[2] G01N *33/00*
U.S. Cl. 73—23 **35 Claims**



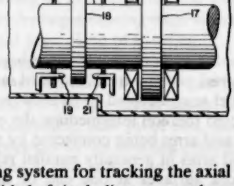
1. A pneumatic detector of gas and vapor contaminants in the air of industrial buildings comprising:
a jet sensor having
a body,
a feed pipe and
a receiving pipe, the feed pipe and the receiving pipe being accommodated in said body;
a reference gas channel conducting a reference gas into said feed pipe;
an analyzed gas channel conducting air of industrial buildings into said feed pipe;
a first switching element with three inlets and an outlet, the first inlet being connected to said reference gas channel, the second inlet being connected to said analyzed gas channel, and the outlet of said first switching element communicating with said feed pipe;
a pulser whose outlet is connected to the third inlet of said first switching element and which serves as an element for setting the operational mode;
a pressure comparator with two inlets and an outlet, the first inlet being connected with said receiving pipe;
a first reference pressure setter communicating with the second inlet of said pressure comparator;
a second switching element with two inlets and two outlets, the first inlet communicating with said outlet of said pressure comparator;
a delay unit having an inlet and an outlet, the outlet being in communication with the second inlet of said second switching element, the inlet being in communication with the outlet of said pulser;
an output relay whose inlet is connected to the first outlet of said second switching element;
a first switch having a control inlet and an outlet, the control inlet being connected to the second outlet of said second switching element, the outlet communicating with an inlet of said pulser;
a vacuum former for building up a vacuum in said body of said jet sensor;
a pressure adder, which is an element of said vacuum former, provided with three inlets and an outlet, the first inlet communicating with an inner space of said body of said jet sensor;
a second switch, which is an element of said vacuum former, having an inlet, a control inlet and an outlet, the outlet being connected to said second inlet of said pressure adder, the control inlet of said second switch being connected to the outlet of said pulser;
an integrator, which is an element of said vacuum former, having an inlet and an outlet, the outlet being connected to said inlet of said second switch;
a third switching element, which is an element of said vacuum former, having two inlets, a control inlet and one outlet, the outlet being connected to the inlet of said integrator, the control inlet being connected to said outlet of said pulser;
a second reference pressure setter, which is an element of said vacuum former, connected to said first inlet of said third switching element;
a third reference pressure setter, which is an element of said vacuum former, connected to said second inlet of said third switching element;
a pressure divider, which is an element of said vacuum former, having a central point, which communicates with said third inlet of said pressure adder, an inlet, which communicates with the first reference pressure setter, and an outlet, which is vented to the atmosphere;
a third switch, which is an element of said vacuum former, having a control inlet connected to the outlet of said pulser, an inlet communicating with the central point of said pressure divider, and an outlet communicating with the atmosphere;
an amplifier whose inlet is connected to the outlet of said pressure adder; and
a vacuum pump connected to an outlet of said amplifier and communicating with the inner space of said body of said jet sensor.

4,073,184

SHAFT AXIAL POSITION MONITORING SYSTEM

David J. Collins, Salem, N.Y., assignor to General Electric Company, Schenectady, N.Y.

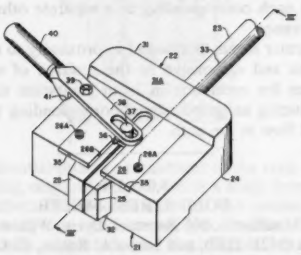
Filed Feb. 16, 1977, Ser. No. 769,015
Int. Cl.[2] G01B *13/12*
U.S. Cl. 73—37.6 **8 Claims**



1. A monitoring system for tracking the axial movement of a rotating shaft, said shaft including an annular runner rotatable with said shaft; and, said monitoring system comprising:

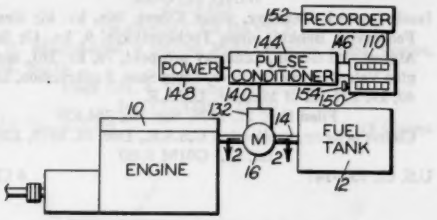
a pair of fluidic nozzles, each nozzle having a discharge end closely adjacent an opposite surface of said shaft runner;
a pressurized air supply to be delivered to each of said fluidic nozzles;
a first flow divider circuit in combination with said air supply and one of said fluidic nozzles;
a second flow divider circuit in combination with said air supply and the other of said fluidic nozzles; and,
each flow divider circuit including three pressure adjustable branches; a first branch providing a setpoint for an alarm amplifier; a second branch providing a setpoint for a trip amplifier; and, a third branch connected to one or the other of said fluidic nozzles and to said alarm and trip amplifiers whereby pressurized air is supplied in parallel at separately adjustable pressures to each of said alarm and trip amplifiers and to each of said fluidic nozzles.

4,073,185
TEST PIECE GRIPPING DEVICE
Alvin G. Griffin, 1006 Old Gate Road, Pittsburgh, Pa. 15235
Filed Nov. 3, 1976, Ser. No. 738,640
Int. Cl.[2] G01N *3/04*
U.S. Cl. 73—103 **8 Claims**



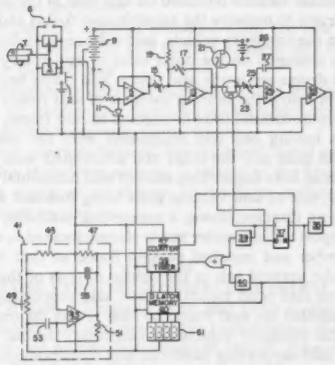
1. A test piece gripping device comprising a housing having a test piece receiving end and an opposite end adapted for connection to physical testing apparatus, said housing having longitudinal side pieces formed with parallel edge surfaces, said side pieces having coplanar front face surfaces terminated by a parallel and raised pad surface defined by a crosspiece connecting said side pieces at corresponding ends thereof, said housing including a wall extending between said side pieces and to said crosspiece while forming a back planar surface parallel with the coplanar front face surfaces of said side pieces, the back planar face surface being terminated by a parallel and raised pad surface extending between said side pieces and to the test piece receiving end of the housing, said raised pad surfaces defining housing reinforcing ribs for maintaining an optimum pull axis along the housing, said longitudinal side pieces providing a pair of opposed wedging surfaces which converge away from said crosspiece, a pair of jaw members slideable over said wedging surfaces and including opposed faces adapted to grip a test piece therebetween along said pull axis, said jaw members having coplanar outer faces, each of said coplanar faces terminating a cam surface which is inclined in a direction opposite the inclination of the wedging surface with which each of said jaw members is engaged, a unitary cam member engaged with said cam surfaces, means projecting outwardly of said cam member for moving the cam member longitudinally of said housing to effect simultaneous movement of said jaw members along said wedging surfaces and hence into a spaced-apart condition for receiving a test piece therebetween, a faceplate secured to said housing and overlying said cam member and said jaw members, said faceplate having a longitudinal slot through which said means extend, and resilient members interposed between said jaw members and said crosspiece for urging said jaw members along said wedging surfaces into a clamping condition.

4,073,186
FLOW METER AND METERING SYSTEMS
Curtis L. Erwin, Jr., 5805 SE. Gladstone, Portland, Oreg. 97206
Filed Nov. 1, 1976, Ser. No. 737,485
Int. Cl.[2] G01F *9/02*
U.S. Cl. 73—114 **50 Claims**



18. A flow meter for measuring fluids comprising a housing having a fluid compartment, movable means in said fluid compartment arranged to be operated by the fluid flow, magnet means in said fluid compartment, an electric circuit, solid state magnetic pickup means in said circuit actuated by said magnet means and having an output, said pickup means being disposed remote from said fluid compartment but within the influence of said magnet means for actuation thereby, and indicating means responsive to the output of said pickup means indicating fluid flowing through said meter.

4,073,187
ELECTRONIC TORQUE WRENCH
John A. Avdeef, 11700 SW. Butner Road, No. 218, Portland, Oreg. 97225
Filed July 19, 1976, Ser. No. 706,921
Int. Cl.[2] G01L *1/16;* B25B *23/14*
U.S. Cl. 73—139 **3 Claims**



1. Apparatus for measuring torque applied to a structure comprising:
torque applying means:
a piezoelectric element for generating from within the piezoelectric element an electrical signal in response to application of a torque force;
means for amplifying the signal generated by the piezoelectric element;
a selectively operable internal calibrating standard cell operatively connected to the piezoelectric element and to the amplifying means;
means for integrating the amplified signal over a predetermined time interval, the integrating means including timing and counting means;
further means for collecting the integration result, the collecting means operatively connected to a memory unit;

and a readout display associated with the memory unit for displaying the integration result, the readout display selectively adjustable to present measured torque values in one of a plurality of physical measuring units.

4,073,188

WIND TUNNEL

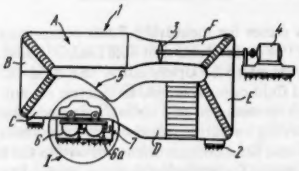
Isaak Isaevich Slezinger, ulitsa Kirova, 40a, kv. 41; Gennady Fedotovich Babkin, ulitsa Tuchkovskaya, 9, kv. 13; Samuil Matusovich Gorlin, Leninsky prospekt, 78, kv. 161, and Regina Valentinovna Belyaeva, Teply Stan, 3 mikroraion, korpus 40, kv. 127, all of Moscow, U.S.S.R.

Filed Dec. 27, 1976, Ser. No. 754,679

Claims priority, application U.S.S.R., Dec. 30, 1975, 2306498

Int. Cl.² G01M *9/00*

U.S. Cl. 73—147 **4 Claims**



1. A wind tunnel for testing a transport vehicle comprising: a base; a system of channels for an air stream mounted on said base; a working chamber of said system to accommodate the transport vehicle under test; a means for creating the air stream in said system; rotary drums, for studying the power characteristics of the transport vehicle under test, mounted on said base so that their bearing surfaces are located in said working chamber and are essentially level with the floor of said working chamber; means for measuring the power characteristics of the transport vehicle mechanically linked with said rotary drums; a wind tunnel balance mounted on said base in the zone of said rotary drums to measure the aerodynamic forces and moments acting on the transport vehicle, said balance including a frame, which is arranged on the outer sides of said rotary drums so that said drums are inside said frame, said frame being located somewhat below the bearing surfaces of said rotary drums, at least three horizontal links connected to said frame, and vertical links having one end articulated with the ends of said horizontal links and the other end articulated with said base, said vertical links connecting each of said horizontal links with said base, one of said vertical links being directed up and the other being directed down; a supporting platform, on which the transport vehicle under test is placed, located in said working chamber and installed on said frame so that it can turn around the vertical axis in the course of tests of the transport vehicle on said wind tunnel balance, said supporting platform being installed on said frame so that it can be removed for testing the transport vehicle on said rotary drums; means for turning said supporting platform; and dynamometers secured on said base and linked mechanically with said frame.

4,073,189

FLUID FLOW MONITORING DEVICE

Robert N. Draper, Boring, Oreg., assignor to Western Skyways, Inc., Portland, Oreg.

Filed July 22, 1976, Ser. No. 707,621

Int. Cl.² G01F *1/28*

U.S. Cl. 73—228 **12 Claims**

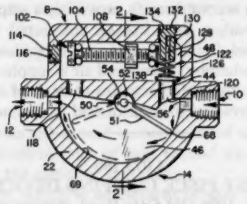
1. A device for indicating a fluid flow rate comprising:

a housing;

partition means for separating said housing into first and second chambers, said first chamber having an inlet port and an outlet port and defining a path for fluid flow between said ports;

a shaft extending through an opening in said partition and projecting at least partially into both of said chambers, the opening being of sufficient size to allow pivoting of said shaft and to allow fluid to pass therethrough around said shaft;

a vane connected to said shaft and disposed at least partially in the first chamber in the path intermediate said ports for movement to positions which vary in accordance with the rate of fluid flow in the path, and wherein movement of said vane causes said shaft to pivot;



armature means positioned in said second chamber and connected to said shaft, wherein pivoting of said shaft causes said armature means to move from one position corresponding to one position of said vane to other positions each corresponding to a separate other position of said vane;

transformer means positioned in proximity to said armature means and responsive to the position of said armature means for receiving an input excitation signal and for producing an output signal corresponding to the rate of fluid flow in the path.

4,073,190

COLD STRESS METER

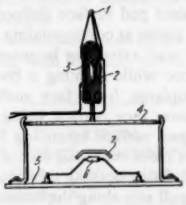
Lloyd E. MacHattie, 105 Banstock Drive, Willowdale, Ontario, Canada (M2K 2H7), and Lorne A. Kuehn, 65 Clayhall Cres., Downsview, Ontario, Canada (M3J 1W6)

Filed Sept. 21, 1976, Ser. No. 725,260

Claims priority, application Canada, Sept. 23, 1975, 236085

Int. Cl.² G01K *1/00, 3/00*

U.S. Cl. 73—339 C **13 Claims**



1. A still shade temperature measuring instrument comprising:

(i) a bead transistor element mounted for exposure to the sun and wind,

(ii) a first semiconductor diode longitudinally mounted vertically below said element, covered by a black circular-knit sleeve, of yarn having a low moisture-regain, the sleeve having a diameter of about ⅜ inches and a length of about 1 inch,

(iii) at least one second semiconductor diode mounted horizontally below the first diode,

(iv) a metal disc centrally located about ¼ inch above the second diode, for shielding the second diode from the sun, but allowing exposure to ambient air, and

(v) circuit means for applying current to the bead transistor element and to the diodes whereby voltages are obtained and modified representative of the expression

$T_{st} = T_a - 0.18H + HI_a + 230\tau\alpha I_a$

where T_{st} is an output signal representative of the still shade temperature in degrees Celsius,

T_a is representative of the ambient temperature in degrees Celsius,

H is representative of the non-evaporative rate of body heat loss in KCal/m^2 hr.,

I_a is representative of the thermal insulation resistance of still air outside of clothing in degrees C m^2hr/KCal.,

τ is representative of the sunlight intensity, and

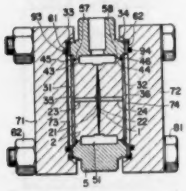
α is representative of the absorptance of clothing, and means for obtaining an output signal from the circuit means having the value T_{st}.

4,073,191

DIFFERENTIAL PRESSURE TRANSDUCER

Tokuji Saigusa, Musashino, Japan, assignor to Yokogawa Electric Works, Ltd., Tokyo, Japan

Filed Dec. 2, 1976, Ser. No. 747,012
Int. Cl.² G01L 7/08, 9/12
U.S. Cl. 73—706 **8 Claims**



1. In a differential-pressure transducer of the type comprising: a measuring diaphragm mounted in a body forming two internal chambers on opposite sides of the measuring diaphragm; a housing having an internal space within which said body is elastically supported; seal diaphragms forming isolation chambers remote from said internal chambers and having sides subjected to measuring pressures; and fluid passageway means connecting each internal chamber to a respective isolation chamber;

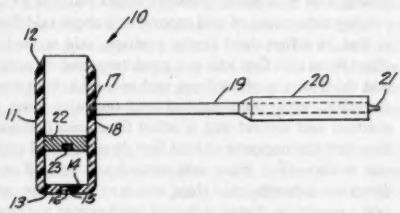
that improvement wherein said seal diaphragms are fastened to said housing.

4,073,192

ADJUSTABLE VOLUME MEASURING CUP

Richard F. Townsend, 1752 North St., Anderson, Calif. 96007

Filed June 16, 1976, Ser. No. 696,555
Int. Cl.² G01F 19/00
U.S. Cl. 73—429 **1 Claim**



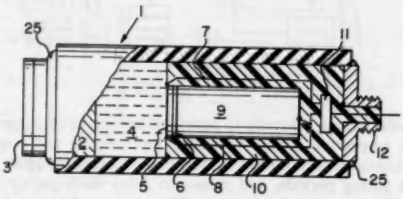
1. An adjustable volume measuring cup comprising a generally cylindrical transparent plastic barrel having inner and outer walls and an open top portion and closed bottom portion, said closed bottom portion includes an opening centrally disposed therein and a removeable plug member formed to seal the opening, a disc frictionally contacted within the barrel's inner walls, said disc being parallel to said top and bottom portions and said cup is provided with removeable hand means which is transversely fastened to a threaded bore in said outer wall and can be removed therefrom to move said disc vertically upward or downward to vary the volume above and below said disc in said barrel to thereby adjust the capacity of said measuring cup, and said outer wall includes a scale for marking the position of said disc.

4,073,193

TRANSDUCER DEVICE

John R. Mastandrea, 8 Stirrup Road, Rancho Palos Verdes, Calif. 90274

Filed Oct. 4, 1976, Ser. No. 728,997
Int. Cl.² G01N 15/00
U.S. Cl. 73—432 PS **16 Claims**



1. A transducer device comprising:

a housing comprising a material of low elastic wave propagation velocity and high wave attenuation properties;

a front surface element mounted at one end of said housing, said front surface element having a front surface arranged to accept mechanical energy for creating an elastic wave therein, said front surface element comprising a material having high elastic wave attenuation properties;

a rear surface element mounted relative to said housing and spaced from said front surface element, said rear surface element comprising a material having high elastic wave attenuation properties;

a thin transducer element mounted upon the rear surface element between the rear surface element and the front surface element; and

means between the front surface element and the thin transducer for transmitting elastic waves but which means does not transmit transverse elastic waves,

whereby a characteristic of the electrical signal output of said thin transducer element is related to the first and the fastest elastic wave created at the front surface of said front surface element.

4,073,194

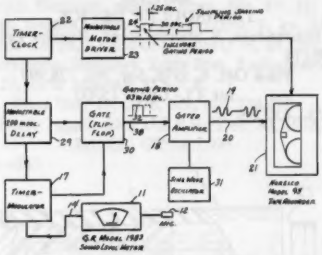
NOISE CHRONO-DOSIMETER SYSTEM

Robert D. Willson, Cincinnati, Ohio, and Terry L. Henderson, Fort Mitchell, Ky., assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Oct. 8, 1976, Ser. No. 731,092
Int. Cl.² G01H 5/00
U.S. Cl. 73—646 **9 Claims**

1. A system for the periodic sampling and recording of a changeable condition in an area, comprising magnetic tape recorder means, timed clock and operating period-defining means drivingly connected to said tape recorder means and driving said tape recorder means for a predetermined operating period at the end of successive sampling spaced periods, condition-responsive transducer means located in said area to develop an electrical signal changing in strength in accordance with said condition, oscillator means generating constant-frequency waves, variableperiod gating means, means to adjust the gating period of said gating means in accordance with the strength of said electrical signal, means controlled by said timed clock and period-defining means to gate said waves with

said gating means after each sampling spacing period and during an operating period of said tape recorder means, whereby to produce successive timed strings of pulses whose number is in accordance with the respective strengths of said electrical signal after said sampling spacing periods, means to supply said strings of pulses as an input to said magnetic re-



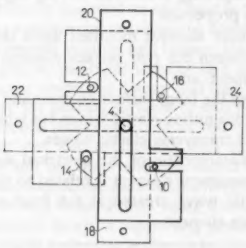
corder means, whereby to provide a tape recording containing the respective strings of pulses representing the respective strengths of said transducer-developed electrical signals during the gating periods, and means to delay each gating of said oscillator waves for a time sufficient to enable said tape recorder means to attain a substantially steady speed.

4,073,195

LOCKING MECHANISM

Matityahu Grosinger, Sokolov Str. 16, Bnei Brak, and Mordechai Salomon, Wilson Str. 5, Tel Aviv, both of Israel

Filed Aug. 26, 1976, Ser. No. 717,904
Claims priority, application Israel, Sept. 5, 1975, 48058
Int. Cl.[2] F16H *21/16*
U.S. Cl. 74—25 **10 Claims**



1. A locking mechanism to operate a latching means of multilatch locking device, comprising:

a housing supporting an axle;

a rotatable plate having a central aperture receiving said axle rotatably coupling said rotatable plate thereto, said plate having at least two projecting pins displaced from each other;

at least two linearly displaceable plate members including linkages freely linking said plate members to said rotatable plate and to said axle for transverse linear movement relative to each other and to said axle, said linkages including in each said plate member a pair of slots extending substantially normally to each other, one of said slots extending axially of said plate member and linking thereof to said axle to provide a common connection among said plate members and said axle, and the other of said slots linking said plate member solely to one of said projecting pins; and,

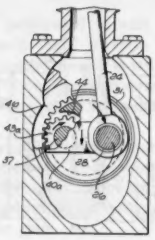
the arrangement being such that upon rotation of said rotatable plate each of said linearly displaceable plate members freely extends outwardly linearly from each other and from said axle to facilitate and effect a linear displacement of the latching means of said multilatch locking device.

4,073,196

CRANKING SYSTEM OF VARYING RADIUS

Basil Dell, Santa Ana, Calif., assignor to Gilbert T. Hendren, Jr., Huntington Beach, Calif., a part interest

Filed Aug. 13, 1976, Ser. No. 714,190
Int. Cl.[2] F16H *37/12*
U.S. Cl. 74—52 **9 Claims**



1. A drive mechanism comprising:

a first structure mounted to turn about a predetermined first axis;

a second structure connected to said first structure for rotary movement relative thereto about a second axis which is offset from said first axis and revolves thereabout as said first structure turns;

said second structure having a crank throw;

a part operatively connected to said crank throw in power transmitting relation and for relative rotation about a third axis which is offset from said second axis to rotate thereabout as said second axis revolves about said first axis;

a gear centered about said first axis and relative to which said two structures move; and

a second gear connected to said second structure for movement therewith and meshing with said first gear and having one-half as many teeth as said first gear to maintain the rotary movement of said second structure about said second axis in a predetermined timed relation to the revolving movement of said second axis about said first axis, so that, in a first dead center position, said second axis is offset from said first axis in a predetermined direction and said third axis is offset from said second axis in the same direction, while in a second and opposite dead center position said second axis is offset from said first axis in a direction the opposite of said first direction and said third axis is also offset from said second axis in said opposite direction, whereby said third axis is spaced from said first axis a maximum distance in said dead center positions and shorter distances in positions intermediate said dead center positions;

the spacing between said second and third axes being substantially greater than the spacing between said first and second axes so that, when the mechanism is in a position midway between said two dead center positions, said second and third axes are offset in opposite lateral directions from said first axis, and said third axis therefore follows a generally elliptical path about said first axis.

4,073,197

MECHANICAL POWER AMPLIFIER, IN PARTICULAR FOR A MACHINE VISE

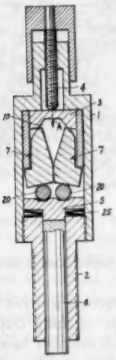
Franz Arnold, Spatzenweg 20, 8906 Kempten, Germany; Oscar Boehm, Basagoiti, 31, Algorta (Viscaya), and Ignacio Cenaruzza, Mocherin 38, Eibar (Guipuzcua), both of Spain

Filed Apr. 19, 1976, Ser. No. 678,267

Claims priority, application Germany, Apr. 22, 1975, 7512789[U]

Int. Cl.[2] F16H *21/44*

U.S. Cl. 74—110 14 Claims



1. A mechanical power amplifier for a vise, comprising:

housing means;

a primary member having cam surface means thereon and a secondary member having abutment surface means thereon, at least said primary member being mounted for movement with respect to said housing means;

force transmitting means mounted for reciprocal movement relative to said housing means;

force amplifying transmitting means mounted in said housing means for effecting an amplification of and a transfer of force from said primary member to said force transmitting means, said force amplifying transmitting means comprising a pair of bell-crank levers arranged in a mirror-image manner relative to the center axis of said housing means, each bell-crank lever having a long lever arm with a wedge surface thereon and a short lever arm, said wedge surface engaging said cam surface means and being movable laterally in response to a movement of said primary member, and a pair of laterally spaced roller means positioned on opposite sides of said center axis of said housing means for rollingly engaging said short lever arm and said abutment surface means and effecting a transfer of force therethrough without a relative sliding movement therebetween;

arcuate surface means on a side of each of said short lever arms remote from said rollers, the center point for said arcuate surface means being radially spaced from the point of engagement of said short lever arm with said roller;

whereby said force transmitting means is moved relative to said housing means in response to a lateral movement of said arcuate surface means of said bell-crank lever caused by a movement of said primary member and said cam surface relative to said long lever arm so that each of said bell-crank levers are rocked about an axis defined by the location of engagement between said short lever arm and said roller.

4,073,198

APPARATUS FOR CHANGING THE SPEED RATIO BETWEEN FIRST AND SECOND DISPLACEABLE MEMBERS

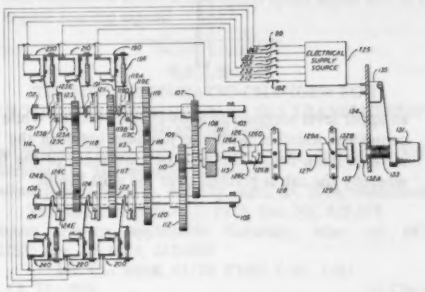
Michael Alan Ford, Maidenhead, England, assignor to Perkin-Elmer Limited, Beaconsfield, England

Filed Aug. 20, 1976, Ser. No. 716,301

Claims priority, application United Kingdom, Aug. 21, 1975, 34750/75

Int. Cl.[2] F16H *3/08, 1/00;* G01D *15/18*

U.S. Cl. 74—360 22 Claims



1. Apparatus for obtaining a change in speed ratio to control a scale change comprising:

(a) a first displaceable member;

(b) a second displaceable member;

(c) speed transfer means operatively relating in motion to said first displaceable member for controlling the rate of relative displacement between the two members so as to enable any one of a predetermined range of speed ratios to be established therebetween corresponding to a desired scale in which the displacement of said second member is to be represented relative to the displacement of said first member;

(d) means for selecting a desired speed ratio; and

(e) phasing means which, accounting for a selected speed ratio, enable the relative displacement of the two displaceable members to be adjusted in operation with repeatable accuracy before said selected speed ratio and therefore the corresponding scale is enabled so that, given a basic displacement step of the first displaceable member, successive displacement steps of said first displaceable member from a positional origin thereof, each representing an exact fraction or multiple of said basic displacement step that is determined by the selected scale expansion or compression, respectively, always correspond to successive equal and invariable displacement steps of the second displaceable member from a positional origin thereof no matter where the speed change takes place past the positional origin of said first displaceable member.

4,073,199

BREAK-OVER SHIFT LEVER ASSEMBLY

Wayne K. Simons, Federal Way, Wash., assignor to Paccar Inc, Bellevue, Wash.

Filed Oct. 22, 1976, Ser. No. 735,089

Int. Cl.[2] G05G *9/00*

U.S. Cl. 74—473 R 3 Claims

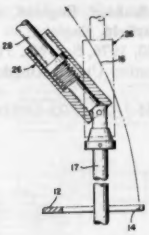
1. A break-over shift lever assembly for cab-over-engine automotive trucks wherein the entire cab including a floor pivots about a forward pivot axis to expose the engine beneath the cab, comprising:

a transmission shift assembly having a two-piece shift handle connected below the cab floor to shift linkages and movable between fore and aft and lateral positions to operate the shift linkages,

said floor having a slot with said shift handle extending upwardly above the slot but in an interference location

with the path of the floor as the floor is swung about the forward pivot axis, and

means for releasibly breaking the two-piece shift handle into



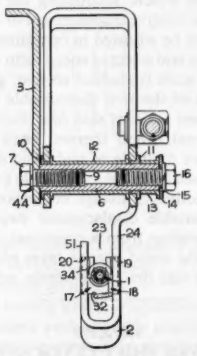
an upper lever section and a lower lever section while still connected together with the juncture between the two sections lying below the path of movement of the floor whereby the cab is pivoted over the shift handle.

4,073,200

CABLE RETAINER

John R. Plate, and James H. Lucas, both of Milwaukee, Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Aug. 9, 1976, Ser. No. 712,719
Int. Cl.² F16C *1/10*
U.S. Cl. 74—501 R **10 Claims**



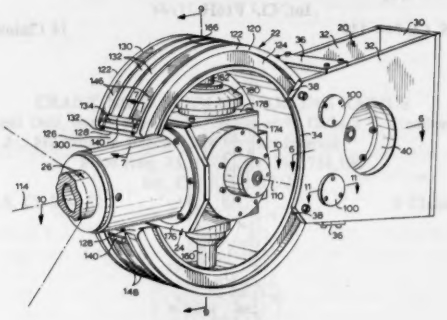
1. A mechanism including a cable retainer comprising, a mounting means, a lever pivotally mounted on said mounting means, a cable support on said lever, a cable, means defining support members in spaced relation on said cable support forming a cable opening, means in said support members defining axially aligned holes, a trunnion received for pivotal movement in said holes, said trunnion defining a transverse slot for alignment with the cable opening between said support members and receiving said cable whereby said cable holds said trunnion on said cable support, a resilient clip including a portion extending under said trunnion and tabs extending over said cable for locking said cable on said trunnion and preventing axial movement of said cable relative to said trunnion.

4,073,201

POWERED WRIST JOINT

Henry James Taylor, Willowdale, and Philip Nicholas Peter Ibbotson, Mississauga, both of Canada, assignors to Spar Aerospace Products Limited, Toronto, Canada

Filed Oct. 15, 1976, Ser. No. 732,733
Int. Cl.² F16H *37/06*; F16M *11/04*
U.S. Cl. 74—665 L **13 Claims**



1. A powered wrist joint comprising,

(a) a base member,

(b) a pitch member having a drive chamber formed therein and a yaw passage opening outwardly from said drive chamber, said pitch member being mounted on said base member for rotation about a pitch axis which extends through said drive chamber,

(c) pitch drive means on said base and drivingly connected to said pitch member for rotatably driving said pitch member about said pitch axis,

(d) yaw shaft means mounted on said pitch member and extending across said drive chamber along a yaw axis which is disposed at right angles to and intersects said pitch axis,

(e) a housing mounted on said yaw shaft means for rotation about said yaw axis,

(f) yaw drive means mounted in said housing and drivingly connected to said yaw shaft for rotatably driving said housing about said yaw axis, and

(g) a roll shaft mounted for rotation in said housing about a roll axis which is disposed at right angles to said pitch and yaw axes and intersects said pitch and yaw axes at their point of intersection and thereby provides a common center of pitch, yaw and roll gyration, said roll shaft projecting outwardly from said drive chamber in a yaw plane which extends through said yaw passage, roll drive means mounted in said housing and drivingly connected to said roll shaft for rotatably driving said roll shaft about said roll axis.

4,073,202

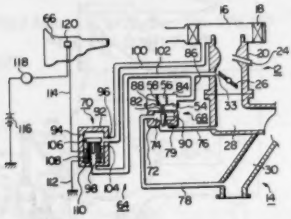
SYSTEM TO FEED EXHAUST GAS INTO THE INTAKE MANIFOLD

Syunichi Aoyama, Yokohama, and Yasuo Nakajima, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Apr. 19, 1976, Ser. No. 678,433
Claims priority, application Japan, May 19, 1975, 50-60023
Int. Cl.² F02B *33/00*; F02M *25/06*; F02D *13/00*
U.S. Cl. 74—860 **4 Claims**

1. An exhaust gas feed system for use with an internal combustion engine having a carburetor, a throttle valve rotatably disposed in an air-fuel mixture passage defined in said carburetor, an intake manifold for conveying the mixture to said engine, and an exhaust manifold for conveying the exhaust gases from said engine before discharging the same into the open air,

said exhaust gas feed system comprising a first conduit fluidly connecting said exhaust manifold with said intake manifold for feeding a portion of exhaust gases in said exhaust manifold into said intake manifold; a restrictor disposed in said first conduit and having therein an opening operable to allow the exhaust gases passing therethrough to have a sonic velocity; valve means for varying the opening degree of said opening of said restrictor when actuated; pressure responsive means including a chamber fluidly connected through a second conduit with a port formed in said carburetor, and a movable member mov-



able in response to vacuum supplied to said chamber, said port being located at a place where said port is positioned in the intake manifold side when the throttle valve is rotated at a predetermined angle from its closed position, said movable member carrying said valve means for actuating the same; a third conduit fluidly connecting said chamber of said pressure responsive means with the clean air side of an air filter; and magnetic valve means disposed in said third conduit and arranged to selectively close and open the passage of the same when electrically energized and de-energized.

4,073,203

ELECTRONIC TRANSMISSION GEAR CHANGE CONTROL SYSTEM

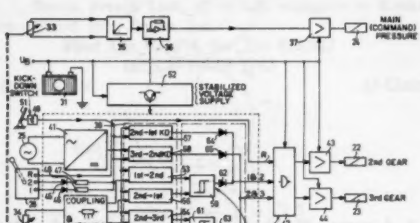
Bert Wurst, Moglingen, and Harald Vogt, Schwieberdingen, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 10, 1975, Ser. No. 621,513

Claims priority, application Germany, Oct. 11, 1974, 2448540

Int. Cl.² B60K *41/18*

U.S. Cl. 74—866 **32 Claims**



1. Electronic transmission gear changing control system, particularly for automotive automatic transmissions for combination with internal combustion engines, said transmission having at least two forward speed gear ranges (1st, 2nd, 3rd), gear selection operating means (22, 23, 24) connected to the transmission and engaging selected gears therein, and transmission output speed transducer means (25) coupled to the output of the transmission and generating a transmission speed signal, said engine having an engine controller (28, 51) and engine load transducer means (29) generating an engine operating signal;

said system comprising first and second separate control means (53, 54, 88; 55, 56, 89) connected to and controlling said gear selection operating means (22, 23, 24); the first control means (53, 54, 88) controlling shifting of gears in the transmission to higher speed ranges (53, 88: 1st to 2nd; 54: 2nd to 3rd) and the second control means (56, 55, 89) controlling shifting of gears in the transmission to lower speed ranges (55: 3rd to 2nd; 56, 89: 2nd to 1st) wherein switching thresholds, with respect to engine speed, of said first control means and said second control means, are different;

said separate control means each having inputs connected to and responsive to the transmission speed signal and to the engine loading signal.

4,073,204

TRANSMISSION-RATIO-CHANGER FOR MULTIPLE-TRANSMISSION-RATIO TRANSMISSION ARRANGEMENT

Heinrich Dick, Heidenheim, Brenz, Germany, assignor to Voith Getriebe KG, Heidenheim, Germany

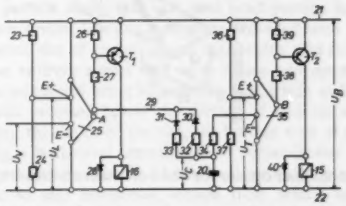
Continuation of Ser. No. 463,379, April 23, 1974, abandoned.

This application Nov. 7, 1975, Ser. No. 629,975

Claims priority, application Germany, Mar. 16, 1974, 2412753; Apr. 26, 1973, 2321090

Int. Cl.² B60K *41/10*; F16H *5/64, 5/61*

U.S. Cl. 74—866 **16 Claims**



1. In a multiple-transmission-ratio transmission arrangement of the type including at least first and second transmission-ratio-establishing units, particularly brakes and/or clutches, having hydraulically activated and unactivated states said first and second transmission-ratio-establishing units together establishing a first transmission ratio when concurrently said first unit is in a predetermined one of its hydraulic activation states and said second unit is in a predetermined one of its hydraulic activation states, said first and second transmission-ratio-establishing units together establishing a second transmission ratio when concurrently said first unit is in the other of its hydraulic activation states and said second unit is in the other of its hydraulic activation states, an arrangement for changing the transmission ratio of the transmission arrangement, comprising, in combination, a source of hydraulic activating fluid; conduits connected to said source and to said hydraulically activatable transmission-ratio-establishing units; first and second electrically controllable valve means in said conduits for alternately permitting and preventing supply of hydraulic activating fluid to said units, said first and second electrically controllable valve means each having a first electrical energization state and a second electrical energization state, said first electrically controllable valve means being operative when in one of its electrical energization states for causing said first transmission-ratio-establishing unit to assume one of its hydraulic activation states and being operative when in the other of its electrical energization states for causing said first transmission-ratio-establishing unit to assume the other of its hydraulic activation states, said second electrically controllable valve means being operative when in one of its electrical energization states for causing said second transmission-ratio-establishing unit to assume one of its hydraulic activation states and being operative when in the other of its electrical energization states for causing said second transmission-ratio-establishing unit to assume the other of its hydraulic activation states; and

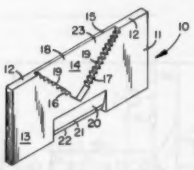
electrical transmission-ratio-selecting means connected to said valve means and operative for changing the transmission ratio of the transmission arrangement by effecting a change of electrical energization state of one of said valve means and a change of electrical energization state of the other of said valve means to accordingly cause a change of state of one of said units and a change of state of the other of said units, and including electronic timing means operative during a change of transmission ratio for delaying the initiation of the change of electrical energization state of one of said valve means until after elapse of a predetermined time interval following initiation of the change of electrical energization state of the other of said valve means, to correspondingly delay the initiation of the change of state of one of said units until after the initiation of the change of state of the other of said units has been effected.

4,073,205

CHILD RESISTANT CONTAINER OPENER

William Arthur Silliman, 1755 Sherington Place, Apartment W102, Newport Beach, Calif. 92660

Filed May 7, 1976, Ser. No. 684,264
Int. Cl.² B67B 7/44
U.S. Cl. 81—3.1 R **2 Claims**



1. A container opener for child resistant containers, comprising:

a body having a bottom surface, a notch in the bottom surface, and a notch surface;

friction means on the notch surface; and

a blade coupled to the body wherein the blade is a thin section of the body and has a prying edge recessed in the body and a metal plate is coupled to the prying edge and extends therefrom wherein the body is plastic and the metal plate is sonic welded to the prying edge.

4,073,206

LONG-HANDLED CUTTING APPARATUS FOR A CLOTH SPREADING MACHINE

Jack M. Gratsch, Cincinnati, Ohio, and Cecil S. Frederick, Murfreesboro, Tenn., assignors to Cutters Machine Company, Inc., Nashville, Tenn.

Filed Jan. 27, 1977, Ser. No. 762,948
Int. Cl.² B26D 1/20
U.S. Cl. 83—489 **5 Claims**

1. A cutting apparatus for a cloth spreading machine comprising:

(a) a cutter head having a knife adapted to cut cloth,

(b) an elongated track member having a length substantially equal to the width of a cloth spreading machine upon which said track member is adapted to be mounted,

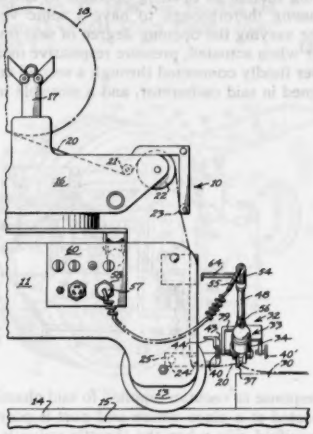
(c) mounting means for mounting said track member to extend longitudinally widthwise of said cloth spreading machine,

(d) guide means on said cutter head cooperable with said track member for movement of said cutter head longitudinally of said track member,

(e) an elongated handle member having a remote end portion and a handle end portion,

(f) swivel coupling means connecting said remote end portion to said cutter head so that said handle member extends generally longitudinally of said track member and is adapted to swing relative to said cutter head generally toward and away from said track member,

(g) a sleeve slidably mounted longitudinally upon said handle member between an operative position covering said



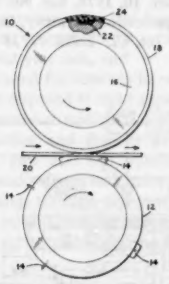
swivel coupling means to render said handle member substantially rigid relative to said cutter head, and an inoperative position uncovering said swivel coupling means to permit said handle member to swing relative to said cutter head.

4,073,207

LOCK FOR ROTARY DIE CUTTING BLANKET

Alan D. Kirkpatrick, Sparta, N.J., assignor to Robud Co., Fairfield, N.J.

Filed Dec. 22, 1976, Ser. No. 753,304
Int. Cl.² B26D 7/20
U.S. Cl. 83—659 **6 Claims**



1. A cutting die blanket for use with an anvil roller of a rotary die cutting apparatus comprising:

a split ring band having a first end and a second end;

a female connector element secured to said first end of said split ring band;

a male connector element rigidly secured to said second end of said split ring band;

a coating material disposed on and securely adhered to one surface of said split ring band, said coating material extendng into and forming a portion of each of said male and female connector elements; and

projection means rididly secured to said coating material, said projection means including a tapered surface, said tapered surface forming a part of said male connector and cooperating with said female connector element to generate a state of compression in the coating of said female

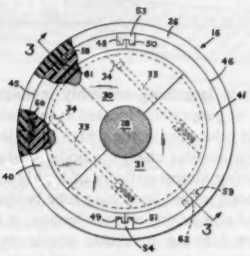
connector element when engaged therewith, said compression being such as to create a resistance to penetration in the coating material of said male and female connector elements which is substantially equal to the resistance to penetration exhibited by said coating material over the remaining surface of said die cutting blanket.

4,073,208

ANVIL STRUCTURE FOR ROTARY DIE CUTTING APPARATUS

Alan D. Kirkpatrick, Sparta, N.J., assignor to Robud Co., Fairfield, N.J.

Filed Mar. 10, 1977, Ser. No. 776,257
Int. Cl.[2] B26D *7/20*
U.S. Cl. 83—659 **11 Claims**



1. Anvil structure for rotary die cutting apparatus, comprising:

an anvil head suitable for mounting on a rotatable shaft, said anvil head having a peripheral surface;

a slip ring, said slip ring including an inner surface which is slidable on said peripheral surface of said anvil head, said slip ring being slidably mounted on said anvil head;

die blanket means mounted on said slip ring; and

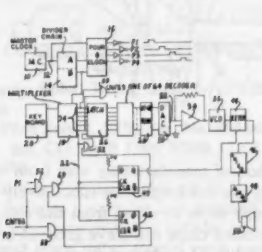
means for releasably locking said die blanket means and said slip ring together.

4,073,209

METHOD AND CIRCUITRY FOR DIGITAL-ANALOG FREQUENCY GENERATION

Billy J. Whittington; Alan B. Welsh, both of Jasper, and Timothy L. Burns, French Lick, all of Ind., assignors to Kimball International, Inc., Jasper, Ind.

Filed Apr. 9, 1976, Ser. No. 675,323
Int. Cl.[2] G01H *1/02*
U.S. Cl. 84—1.24 **23 Claims**



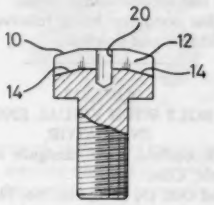
1. A method of generating frequencies corresponding to a predetermined number of actuated ones of a plurality of independently actuatable elements which comprises; repetitively scanning said elements and generating a digital signal corresponding to each said element simultaneous with the scanning thereof, independently storing the digital signals corresponding to actuated ones of said elements during the period of actuation of the respective element, converting each stored digital signal to a respective voltage signal, and supplying the voltage signals simultaneously to the control terminals of respective voltage controlled oscillators.

4,073,210

SCREW

Katsuyuki Totsu, No. 4-7, 3-chome, Oshiage, Sumida, Tokyo, Japan

Filed Sept. 10, 1976, Ser. No. 721,940
Int. Cl.[2] F16B *23/00*
U.S. Cl. 85—45 **4 Claims**



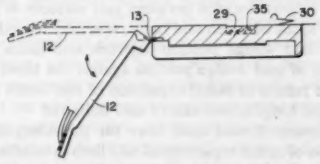
1. A screw having a longitudinal axis and comprising a head portion having a peripheral surface symmetrical about said longitudinal axis and a stem portion extending from one face of the head portion along said axis, said head portion having a second face distant from said one face provided with at least one diametric slot of greater length than width, said slot being continuous entirely across said second face and open at the peripheral edges and being bounded by facing side walls and a bottom wall recessed below the surface of said second face determining the depth of the slot, the bottom wall of the slot comprising a horizontal central section perpendicular to said axis and end sections having a uniform slope forming opposed extensions to said horizontal section from which said end sections downwardly diverge at equal angles with respect to said axis toward said one face, the side walls of said slot bounding said side extensions having throughout their lengths a height relative to the bottom wall at least equal to the height of the side walls bounding the horizontal central section of said slot to thereby present side walls of continuous maximum area terminating at the outer radial extremities thereof.

4,073,211

COLLAPSIBLE GUITAR

Allen C. Jorgensen, Coulee City, Wash., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed July 26, 1976, Ser. No. 708,438
Int. Cl.[2] G10D *3/00, 1/08*
U.S. Cl. 84—291 **3 Claims**



1. A string instrument in the form of a body fitted with a neck that projects beyond the body, on which neck, strings are fixed extending along the neck of the body, in which said body is joined to the neck by a hinge with said neck mounted to the hinge so as to pivot into a recess located in the body and extending from the back panel of the instrument, together with a bridge member to which one end of all the strings are fastena-

ble, said bridge member of a shape to alternatively detachably fasten to

first clamp means fixed to the face of the instrument body, or

second clamp means fixed to a recess section of the instrument body,

said first clamp means located in a position in which the strings are maintained in a first taut condition when the neck is folded to the erect playing position, with the bridge unit attached to said first clamp means, and

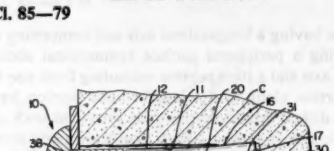
said second clamp means located in a position in which the strings are maintained in a second taut condition when the neck is folded into the body recess, with the bridge unit attached to said second clamp means,

said second taut condition being relatively slack as compared to said first taut condition.

4,073,212
ANCHOR BOLT WITH VISUAL ENGAGEMENT INDICATOR

Lester Lerich, Broomfield, Colo., assignor to Wej-it Corporation, Broomfield, Colo.

Filed Oct. 15, 1976, Ser. No. 732,897
Int. Cl.² F16B *13/04*
U.S. Cl. 85—79 **5 Claims**



1. An anchor bolt adapted for insertion into anchoring engagement with a blind hole, comprising:

an elongated unitary shank portion, an enlarged head portion on one end of said shank portion, and a radially expandible portion on the opposite end of said shank portion having limbs extending longitudinally from said opposite end in spaced-apart relation to each other, said shank portion including an axial bore extending entirely through said head and shank portions into communication with the space between said limbs;

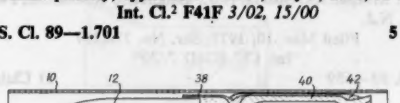
wedge means in the space between said limbs for radially expanding said limbs into frictional and binding engagement with the sides of said blind hole, said wedge means including a flat plate portion thin enough to fit in the space between said limbs and a wedge portion extending longitudinally from said flat plate portion beyond the ends of said limbs and having surfaces diverging away from the longitudinal axis of said bolt in opposite directions such that the largest distance between said surfaces is greater than the space between said limbs, whereby forced movement of said wedge portion between said limbs due to abutment of said wedge portion against the blind end of said hole results in radial expansion of said limbs in relation to the longitudinal axis of said bolt; and

indicator means in said axial bore for providing a visual indication of radial expansion of said limb in relation to the longitudinal axis of said bolt, said indicator means including an elongated finger extending longitudinally from said flat plate portion of said wedge means and is slidably received into said bore such that rearward axial movement of said wedge portion to a position between said limbs resulting in radial expansion of said limbs also causes said finger to slide rearwardly in said bore whereby expansion of said limbs can be detected by visual perception of the position of said finger within said axial bore, said finger being shorter than the combined length of said shank and head portions of said bolt.

4,073,213
ASSEMBLY FOR LAUNCHING A PROJECTILE

Emile J. Stauff, Versailles, France, assignor to Societe Anonyme dite : Societe Europeenne de Propulsion, Puteau, France

Filed June 29, 1976, Ser. No. 700,743
Claims priority, application France, July 2, 1975, 75 20741
Int. Cl.² F41F *3/02, 15/00*
U.S. Cl. 89—1.701 **5 Claims**

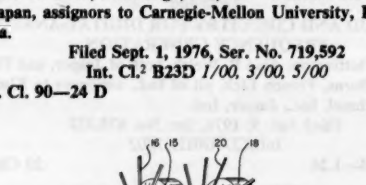


1. A projectile launching assembly including a launching tube, a charge of gunpowder located in said launching tube for firing from said tube a projectile which is loaded in said tube in front of said gunpowder charge, a body of braking propellent powder consisting almost entirely of highly combustible substances positioned in said launching tube behind said gunpowder charge, and comprising a block having, at least, a partially hollow interior forming a tubular nozzle and a cylindrical sleeve connecting said projectile to said body of braking propellent to form a rigid unit which is loadable as a unit into said launching tube, said gunpowder charge being contained within said cylindrical sleeve, and a jacket of resin bonded wound filaments surrounding said body of braking propellent and at least part of said connecting sleeve, said wound filaments and their resin binder both being combustible.

4,073,214
SHAVE FORMING OF WIRE

Milton C. Shaw, Pittsburgh, Pa., and Tetsutaro Hoshi, Kyoto, Japan, assignors to Carnegie-Mellon University, Pittsburgh, Pa.

Filed Sept. 1, 1976, Ser. No. 719,592
Int. Cl.² B23D *1/00, 3/00, 5/00*
U.S. Cl. 90—24 D **6 Claims**



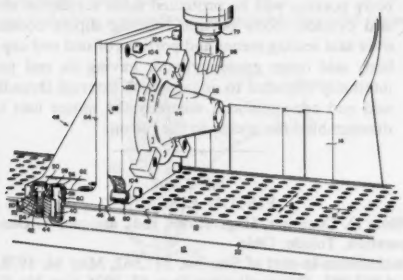
1. The method of manufacturing wire from wire rod comprising moving the rod lengthwise successively past a slotted first cutting edge so as to shave from the rod a plurality of continuous confined chips and leave grooves in the rod separated by a plurality of lands and then past a second cutting edge so as to shave the lands from the rod as unconfined continuous chips, the confined chips being shaved off the rod at an angle sufficient to produce a ratio of worked to unworked chip length of at least about 0.35 and the unconfined chips being shaved off the rod at an angle different from the confined chip angle sufficient to produce a ratio of worked to unworked chip length of at least about 0.35, whereby continuous confined and unconfined chips are produced without cracking.

4,073,215

SUB PLATE ASSEMBLY FOR MACHINE TOOLS

Robert L. Coope, and Lowell W. Munson, both of Phoenix, Ariz., assignors to Stevens Engineering, Phoenix, Ariz.

Filed Oct. 1, 1976, Ser. No. 728,724
Int. Cl.[2] B23D 7/08
U.S. Cl. 90—58 R 10 Claims



1. A tooling setup and subplate means for machine tools comprising: a flat subplate adapted to be supported on and fixed to a conventional flat table of a machine tool; said subplate having an array of openings therein; said openings being in straight parallel spaced apart rows which rows intersect each other at right angles and at centers of said openings; first ones of said openings being internally screwthreaded fixture receiving openings; second ones of said openings being locating openings; each locating opening provided with a first precision bore; a hollow cylindrical bushing precisely engaged in said bore; each bushing having a second precision bore; said locating openings being precisely spaced apart an equal distance in two directions; said directions being 90 degrees apart; a tooling member removeably secured to said subplate; said tooling member having a first portion; said first portion having a first surface engaging said subplate; said first portion provided with fixture receiving openings spaced apart to coincide with said fixture receiving openings in said subplate; said tooling member also having locating openings in said first portion; said last mentioned locating openings spaced apart to coincide with said locating openings in said subplate; said last mentioned locating openings each having a third precision bore; a hollow cylindrical bushing precisely engaged in said last mentioned bore; said last mentioned bushing having a fourth precision bore; and precision dowels precisely interengaged in both the precision bores; in said bushings which are disposed in the locating openings of said subplate and the locating openings in said tooling member.

4,073,216

VALVE CONTROL APPARATUS FOR ROTARY ENGINES

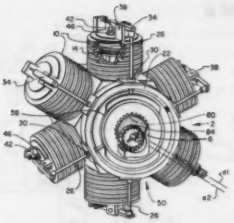
Gilbert E. Davis, Boise, Idaho, assignor to Energy Research, Provo, Utah

Filed July 3, 1975, Ser. No. 593,003
Int. Cl.[2] F01B 1/06; F02B 57/08
U.S. Cl. 91—480 8 Claims

1. Valve actuating apparatus for use in a rotary engine or pump which includes a cylinder unit rotatable about an axis and having at least three cylinders radially arranged about the axis and at least three valve means, each associated with a different cylinder, said apparatus comprising

means defining a generally circular cam track having a pair of lobes disposed substantially diametrically opposite one another, each of said lobes extending circumferentially through an angle of substantially 90°, said cam track means including an annular flange disposed at one side of said cam track and extending radially outwardly therebeyond,

means for causing said cam track means to rotate relative to said cylinder unit, and at least three tappet means carried by said cylinder unit and each coupled to a different valve means for coacting with said cam track to operate the corresponding valve means alternately to open and closed positions with each rotation of the cylinder unit and as the



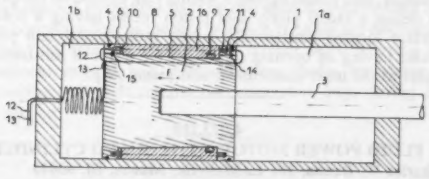
cam track is rotated, each tappet means including a generally elongate member one end of which has a generally flat side face disposed in close proximity with one side of said flange, said tappet means thereby being prevented from rotating.

4,073,217

DEVICE ENABLING THE IMMOBILIZING OF A PISTON IN ITS CYLINDER

Jean-Paul Colin, Saint-Sebastien, France, assignor to Ste Anonyme dite: Ateliers et Chantiers de Bretagne - A CB, Nantes, France

Filed Aug. 2, 1976, Ser. No. 710,991
Claims priority, application France, Aug. 12, 1975, 75 25038
Int. Cl.[2] F15B 15/26
U.S. Cl. 92—27 5 Claims



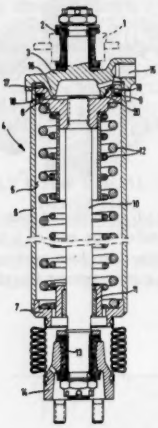
1. A fluid controlled device comprising a cylinder, a piston moveable in said cylinder under fluid pressure and defining therewith two expansible chambers, said piston having an inclining peripheral surface portion intermediate its ends, wedge means mounted on the inclined peripheral surface portion for movement along said surface, annular jacks carried by said piston, said jacks being operatively connected to said wedge means for exerting forces thereon for selective movement of the wedge means towards one or the other ends of said inclining surface portion, means communicating fluid pressure in at least one of the chambers to the piston and cylinder interface, said cylinder having wall portions subject to radial expansion when the cylinder is under pressure to create a clearance between the piston and cylinder wall portions, said wedge means being moveable under the influence of said jacks along the inclined peripheral portion of the piston to a position in which they are radially displaced by an amount essentially equal to the maximum radial clearance between the piston and the wall of said cylinder caused by radial expansion of said cylinder when the cylinder is under pressure.

4,073,218

ACTUATING CYLINDER FOR A MAGNETIC RAIL BRAKE UNIT

Hans Pöllinger, Munich, Germany, assignor to Knorr-Bremse GmbH, Munich, Germany

Filed Aug. 5, 1976, Ser. No. 712,072
Claims priority, application Germany, Aug. 8, 1975, 2535524
Int. Cl.[2] F01B *11/02;* F16J *11/02*
U.S. Cl. 92—85 R 2 Claims



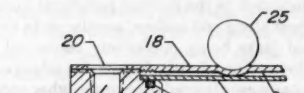
1. A fluid pressure device for actuating a magnetic rail brake unit on a vehicle comprising a cylinder having a head end, a piston slidable within said cylinder and having an end position at said head end, a projection on said cylinder head extending toward said piston and having a first conical stop surface thereon, said piston having a recess therein conforming to said projection and having a second conical stop surface thereon, said first and second stop surfaces defining a pair of concentric conical mating surfaces engageable with each other to stop the piston in said end position, said stop surfaces being at an angle of substantially 30° with respect to the longitudinal axis of the cylinder, said piston having a sealing ring around its periphery to define a radial plane, said piston recess having a bottom surface located substantially in said radial plane, said piston recess having an opening of a diameter which is substantially equal to the inner diameter of said piston ring.

4,073,219

FLUID POWER MOTOR WITH GUARD CYLINDER

Charles W. Bimba, 101 E. Main St., Monee, Ill. 60449

Filed Aug. 16, 1976, Ser. No. 714,796
Int. Cl.[2] F16J *11/04;* F01B *29/00, 31/00*
U.S. Cl. 92—128 1 Claim



1. In a fluid power motor unit a thin cylindrical body portion and end cap members to enclose and accommodate an internal reciprocating piston, separate sealing means at each end of the body portion located between the ends of the body portion and the end cap members for completely sealing the ends of said body portion to said end cap members, at least one piston rod connecting to the piston and extending through an end cap member, and fluid inlet and outlet means for introducing fluid pressure to a working chamber on at least one side of the piston in said body portion, the improved construction to preclude denting of the cylindrical body portion of the unit which comprises:

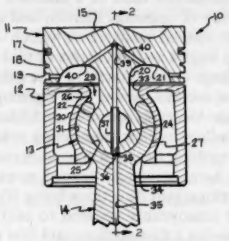
a. providing an encompassing separate guard cylinder around said body portion and spaced slightly therefrom to effect a closed air space which is out of communication with said working chamber, whereby the inner cylindrical body portion will be protected from accidental denting, said cylinder body portion forming slip-fit connections over said sealing means and portions of said end cap members, said outer guard cylinder having its end portions internally threaded to engage with external threading on said end cap members, whereby the motor unit can be disassembled for access to the piston.

4,073,220

PISTON ASSEMBLY

William D. Guenther, Hagerstown, Ind., assignor to Dana Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 577,562, May 14, 1975, Pat. No. 4,013,057. This application Dec. 27, 1976, Ser. No. 754,096
Int. Cl.[2] F16J *1/04, 1/14*
U.S. Cl. 92—190 3 Claims



1. A piston assembly comprising, in combination, a connecting rod, an elongated tubular wrist pin attached at the lower center of an external surface to an end of said connecting rod, said external wrist pin surface defining an external journal surface, said wrist pin further having an internal bearing surface and a top opening extending along its length, a piston head having an upper surface for forming one wall of an expansion chamber and having a bearing member defining a journal surface extending substantially across a lower surface engaging said internal bearing surface of said wrist pin substantially along its entire length, said bearing member and said wrist pin cooperating to permit rotation between same and thereby between said connecting rod and said piston head, a piston skirt free of said piston head, and thrust bearing means attaching said piston skirt to said external journal surface on said wrist pin for rotational movement between same and thereby between said piston head and said piston skirt.

4,073,221

LIGHT-WEIGHT PISTON ASSEMBLIES

Alexander Goloff, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 21, 1976, Ser. No. 697,896
Int. Cl.[2] F16J *1/00*
U.S. Cl. 92—221 1 Claim

1. A piston assembly comprising:

a generally cylindrical piston body having a crown and a depending skirt and being formed of a light-weight metal;

a stepped, peripheral groove in said body adjacent the crown defining a first step opening to the crown and a second step between said first step and said skirt, said first step having a lesser diameter than said second step;

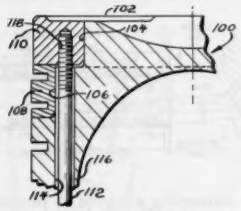
a ring groove protection band formed of a hard metal and

having at least one peripheral groove adapted to receive a compression ring received in said groove in said body and in said second step thereof;

a ring-like annular retainer formed of a light-weight metal received in said groove in said body and in said first step thereof and, together with said ring groove protection band, substantially filling said groove in said body;

a bore extending through said body in said skirt and adapted to receive a wrist pin;

means including a plurality of elongated, threaded fasteners



extending through said body radially inwardly of said second step from at least said bore to said crown at said first step therein and securing said retainer to said crown for sandwiching and clamping said ring groove protection band in said second step between said body and said retainer, and

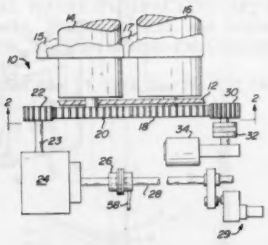
said body being hollow and including a plurality of generally axially extending, radially inwardly directed, hollow bosses located to each side of said wrist pin receiving bore, said threaded fasteners extending through said hollow bosses substantially the entire length of said body.

4,073,222

CONTINUOUS RUNNING MACHINES FOR PRODUCING PAPERBOARD BOX BLANKS

Robert E. Coburn, Warminster, Pa., assignor to Molins Machine Company, Inc., Cherry Hill, N.J.

Filed May 17, 1976, Ser. No. 687,118
Int. Cl.² B31B *1/02*
U.S. Cl. 93—36 M **4 Claims**



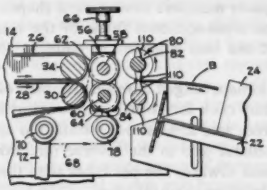
1. Apparatus comprising a continuous running double facer machine having at least one driven pulley for a belt, a tensioner for the belt, a main drive motor coupled to a main drive shaft, means including a first clutch coupling said shaft to said pulley to enable said motor to drive said pulley in a run mode at a first speed, and a discrete auxiliary motor coupled to said pulley by an overrunning clutch for driving said pulley in a continuous run mode at a second speed when said first clutch is disengaged and wherein said second speed is substantially slower than said first speed, said auxiliary motor being of substantially lower horsepower than said main drive motor, circuitry for controlling operation of said belt tensioner and said first clutch so that said first clutch can only be engaged when the belt tensioner is operative.

4,073,223

BAG SLOW DOWN

Donald C. Crawford, Green Bay, Wis., assignor to FMC Corporation, San Jose, Calif.

Filed Oct. 22, 1976, Ser. No. 735,223
Int. Cl.² B31B *1/94*
U.S. Cl. 93—93 HT **2 Claims**



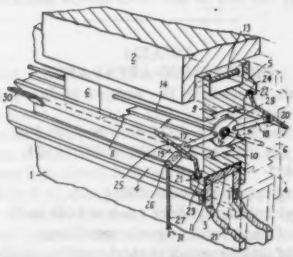
1. In a thermoplastic bag making machine including stacker belts comprising vertically opposed narrow belts for receiving and longitudinally transporting bags, as they are produced, to a stacking table, corrugating wheels and a bag retarding device located at the discharge of said stacker belts, an independent electrically operable variable speed drive driving the stacker belts and the corrugating wheels, said retarding device comprising two contra-rotating vertically spaced shafts mounting axially extending radially projecting pads cooperating to simultaneously momentarily engage opposite panels of each bag adjacent its trailing edge during one revolution of said shafts, the improvement in the combination of said stacker belts and said retarding device comprising adjusting the speed of said variable speed drive for driving said stacker belts at a speed that effects a selected longitudinal separation of the successive bags conveyed to the stacking table, each shaft of said retarding device mounting at least two equally circumferentially spaced pads, drive means derived directly from the drive of said bag machine, for rotating said vertically spaced contra-rotating shafts at a speed such that the peripheral speed of the radially projecting pads is less than the speed of the bags conveyed by said stacker belts, said contra-rotating shafts being synchronized so that the pads on one shaft making contact at a rate corresponding to the rate at which the bags are discharged toward the stacking table by said stacker belts, whereby the rotational rate of said contra-rotating shafts, by virtue of mounting two pads retards two successive bags during one revolution.

4,073,224

VENTILATORS

Johannes Harald Bierlich, Charlottenlund, Denmark

Filed July 7, 1976, Ser. No. 703,294
Int. Cl.² F24F *7/00*
U.S. Cl. 98—41 R **9 Claims**



1. A ventilator, primarily intended to be mounted within a

window sash between the upper rail of the sash and the upper edge of glazing in the sash, said ventilator including

(a) upper and lower bars of uniform cross-section,

(b) a plurality of spacer members located between said bars at spaced intervals along the length of the bars to space the bars apart and defining with said bars at least one ventilation aperture extending from the inside to the outside of the ventilator,

(c) said spacer members having parts shaped to interengage with the cross-sectional shape of the respective bars to connect the bars together in addition to spacing them apart,

(d) a pair of flaps hinged to respective ones of said upper and lower bars each for swinging movement in one direction away from said at least one ventilation aperture to open the ventilator and in the reverse direction for swinging movement towards the bar other than that to which it is hinged to close the ventilator,

(e) a shaft extending between and mounted in the spacer members,

(f) crank means mounted on said shaft, and

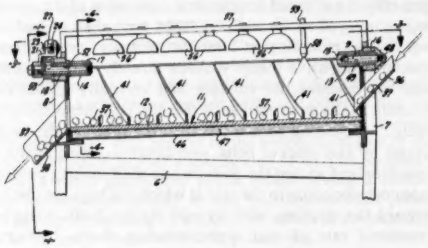
(g) means operatively connecting said crank means with said flaps for simultaneous hinging of the respective flaps in the directions to open and close the ventilator.

4,073,225

ROCKING MEATBALL COOKER

Nils Lang-Ree, Los Altos, Calif., assignor to N.P.I. Corporation, Burlingame, Calif.

Filed Dec. 17, 1976, Ser. No. 751,265
Int. Cl.[2] A47J *27/00*
U.S. Cl. 99—339 **5 Claims**



1. A rocking meatball cooker comprising a frame, an open top trough, means for mounting said trough on said frame for rotation about a substantially horizontal axis, means for repetitively rocking said trough to and fro about said axis through about 90°, means for subjecting said trough to heat, means for supplying one end of said trough with meatballs to be cooked, means for releasing cooked meatballs from the other end of said trough, and vanes in said trough helical about said axis and interrupted partway across said trough for impelling said meatballs from said one end to said other end of said trough.

4,073,226

PROCESSING APPARATUS

Robert J. Shulz, Brookfield, Ill., assignor to Innovative Patent Trust, Palatine, Ill.

Filed Sept. 27, 1976, Ser. No. 726,594
Int. Cl.[2] A47J *27/00*; B65G *19/00*
U.S. Cl. 99—427 **8 Claims**

1. Processing apparatus, comprising

an elongated hollow cylinder open at both ends,

a plurality of imperforate circular partitions,

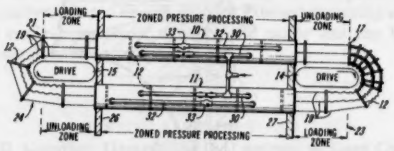
a plurality of sealing means each circumferentially disposed on a respective one of said partitions,

said partitions being movable in spaced apart relationship through said cylinder with said sealing means sealably engaging said cylinder,

said partitions being spaced apart by a distance less than the length of said cylinder to provide a hermetically sealed compartment between said partitions,

a processing fluid inlet port in the wall of said cylinder and spaced from the ends thereof by distances greater than the distance between said partitions,

drive means connected to said partitions for moving said partitions in said spaced apart relationship through said cylinder,



means for connecting a source of processing fluid to said processing fluid inlet port thereby to introduce a processing fluid through the wall of said cylinder into the space between said partitions as said partitions move through said cylinder,

a pair of revent ports respectively provided in said cylinder near the ends thereof, and

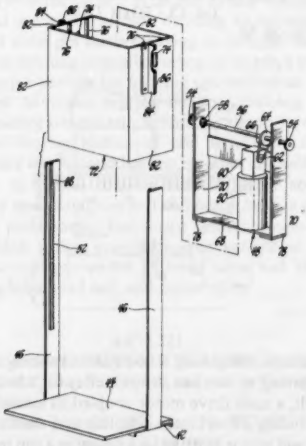
conduit means including a unidirectional flow device connected between said pair of revent ports for coupling steam from a location near the exit end of said cylinder to a location near the forward end of said cylinder.

4,073,227

TRASH COMPACTOR

Dario J. Moriconi, Orange Park, Fla., assignor to Raymond L. Sperry and Selma Sperry, both of Jacksonville, Fla.

Filed Oct. 18, 1976, Ser. No. 733,063
Int. Cl.[2] B30B *15/14, 15/28*
U.S. Cl. 100—52 **17 Claims**



1. An improved trash compactor assembly comprising; a base for supporting a trash receptacle, a reaction arm connected to and extending upwardly from two opposite sides of said base, a drive frame disposed between said arms, a drive motor supported on said frame, drive train means operatively interconnecting said motor and said arms for supporting said frame on said arms and for moving said frame longitudinally of said arms in response to operation of said motor, ram means suspended from said drive frame for insertion into the trash

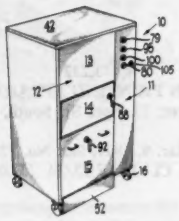
receptacle, and lost motion connection means interconnecting said ram means and said frame for allowing a predetermined amount of lost motion between said ram means and said frame when the force applied to trash in the receptacle by said ram means reaches a predetermined value.

4,073,228

TRASH COMPACTOR

Jerry Henzl, R.R., 2, Box 191, Effingham, Ill. 62401

Filed Apr. 29, 1976, Ser. No. 681,587
Int. Cl.² B30B *15/16*
U.S. Cl. 100—52 **10 Claims**



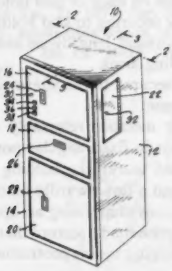
1. A trash compactor comprising a frame having spaced upper and lower braces, vertical posts rigidly connecting said upper and lower braces, a shell covering said frame, said shell forming upper, middle and lower compartments in said frame, an opening in said shell providing access to the middle and lower compartments, a dolly having an open top to receive trash to be compacted, said dolly occupying the lower compartment, a door closing the middle compartment and through which trash is loaded into the open top of the dolly, and means in the upper compartment for compacting the trash in the dolly, said compacting means comprising a plate, a ram below the plate, a pair of hydraulic cylinders connected between the upper brace and plate to lower said plate with reference to the brace, and a second pair of hydraulic cylinders mounted on the plate and connected to the ram to lower the ram with reference to the plate.

4,073,229

VERTICAL WASTE COMPACTING APPARATUS

James O'Rourke, Waldwick, N.J., and Murray Feldberg, Brooklyn, N.Y., assignors to Multi-Pak Corporation, Hackensack, N.J.

Filed Dec. 17, 1976, Ser. No. 751,704
Int. Cl.² B30B *9/00, 15/08*
U.S. Cl. 100—98 R **5 Claims**



1. A compacting apparatus for receiving and compacting waste, which comprises:

a compactor housing having an upper portion, a middle portion and a lower portion;

vertically reciprocating ram means for compacting waste, mounted in the upper portion of said housing, said ram means being of rectangular cross section and being extendable downwardly into the lower portion of said housing:

ram driving means for driving said vertically reciprocating ram means;

waste inlet means in the front middle portion of said compactor housing for receiving waste to be compacted;

removable waste receptacle means for containing waste, said receptacle means being horizontally slidable between a first position in the lower portion of said compactor housing in vertical alignment with said ram means and a second position without the lower portion of said compactor housing, said ram means extending downwardly within the receptacle means while said receptacle means is in the first position to effect waste compaction;

vertically reciprocating sleeve means of rectangular cross-section slidably mounted within said housing surrounding said ram means and having an upper portion and a lower portion, said sleeve means having a rectangular waste inlet aperture in its front upper portion and said sleeve means being extendable downwardly from an upper position, in which access from said compactor housing waste inlet means to said waste receptacle means is blocked by said sleeve, to a lower position in which said sleeve waste inlet aperture is aligned with said compactor housing waste inlet means and the lower portion of said sleeve means extends within said removable waste receptacle means to prevent said ram means from damaging said receptacle means as said ram means is extended downwardly within said receptacle means;

sleeve driving means for driving said vertically reciprocating sleeve means;

control means for controlling the operation of said ram driving means and said sleeve driving means; and

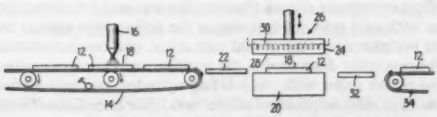
a first shearing knife horizontally mounted on the inner front surface of said sleeve means adjacent to the lower edge of said rectangular waste inlet aperture, and a second shearing knife horizontally mounted on the front edge of said ram means adjacent and parallel to the apertured surface of said sleeve means, said second shearing knife slidably contacting said first shearing knife as said ram means is extended downwardly past said inlet aperture into the lower portion of said housing.

4,073,230

METHOD FOR EMBOSSING MINERAL FIBER BOARD

David Wallace Akerson, St. Paul, Minn., assignor to Conwed Corporation, St. Paul, Minn.

Filed Oct. 20, 1976, Ser. No. 734,326
Int. Cl.² B44C *1/24*
U.S. Cl. 101—32 **3 Claims**



1. Method for embossing mineral fiber sheet wherein said sheet is composed of:

(a) from about 75 to about 85% by weight mineral material, said mineral material being composed of;

(i) from about 20 to about 85% mineral fibers;

(ii) from 0 to about 50% perlite;

(iii) from 0 to about 10% of other mineral materials;

b. from about 15 to about 25% of a binding system, said binding system being composed of:

(i) from about 5 to about 15% by weight cellulosic fibers;

(ii) from about 10 to about 20% of a reactivatable binding agent;

(c) said sheet having a thickness of from about ¼ inch to about 2 inches and a density of from about 15 pounds to about 25 pounds:

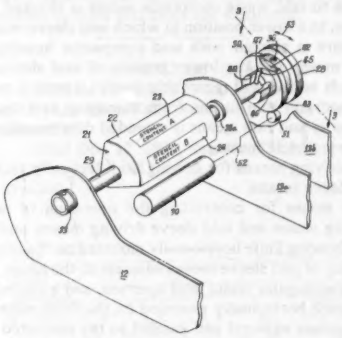
said method comprising the steps of wetting at least one side of the sheet surface with from about 7 to about 15 pounds of water per thousand square feet of board surface and thereafter positioning the sheet on a stationary platen subjecting the sheet surface to treatment with a stationary reciprocating press having a design forming member having a temperature of from about 550° to about 750° F and said design forming member being applied for a period of from about 0.1 seconds to about 2 seconds at a pressure sufficient to deform the surface whereby a permanently embossed pattern is obtained on the surface of the mineral fiber sheet.

4,073,231

SELECTIVE LABEL PRINTER

Gerhard K. Roser, Mount Prospect, Ill., assignor to Weber Marking Systems, Inc., Arlington Heights, Ill.

Filed Nov. 29, 1976, Ser. No. 745,549
Int. Cl.² B41J 3/22; B41F 15/02
U.S. Cl. 101—48 **5 Claims**



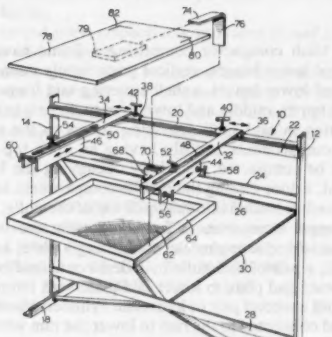
1. A label printer comprising a frame structure, a shaft journally supported in said frame structure, a printing cylinder carried on and affixed for rotation with said shaft, a cam rotor journally mounted for relative rotation on said shaft spaced from said printing cylinder, said cam rotor having a continuously annular outer peripheral cam surface with one indentation therein, means for indexing said cam rotor arcuately relative to said shaft and printing cylinder to either of at least two fixed first and second arcuately spaced apart positions, a cam roller having rolling contact with the outer peripheral surface of said cam rotor, a platen roller cooperating with said printing cylinder to effect printing of label stock passed therebetween, means joining said cam roller and said platen roller in a manner to effect movement of said platen roller into and out of engagement with said printing cylinder as the roller rides against the outer peripheral surface of said cam rotor, said one indentation of the cam rotor determining the position and extent of contact of the platen roller with the printing cylinder, said indentation in the first indexed position of the cam rotor coordinated with a first position on said printing cylinder, said indentation in the second indexed position of the cam rotor coordinated with an arcuately spaced apart second position on said printing cylinder, a stencil for mounting on said printing cylinder having at least two spaced apart first and second indicias cut therein, said spacing of the first and second stencil indicias being equal in length to the arcuate spacing of the first and second indexed positions of the cam rotor, means mounting said stencil onto said printing cylinder so the first stencil indicia is on the first position of the printing cylinder and the second stencil indicia is on the second position of the printing cylinder, and whereby when the cam rotor is in the first of its indexed positions the cam rotor indentation is arranged to have the platen engage the printing cylinder for the printing of only the first of the spaced apart indicias on the stencil and when the cam rotor is in the second of its indexed positions the cam rotor indentation is arranged to have the platen engage the printing cylinder for the printing of only the second of the spaced apart indicias on the stencil.

4,073,232

SCREEN PRINTING APPARATUS

Harold Hazen Brewer, 21 Peel St. South, Dundas, Ontario, Canada

Filed Mar. 9, 1977, Ser. No. 775,689
Int. Cl.² B41F 15/26, 15/36
U.S. Cl. 101—126 **10 Claims**



1. A screen printing apparatus comprising;

a main frame having upright side frame members, an upper cross member and an intermediate cross member;

a pair of printing screen holding arms protruding from the main frame and adjustably mounted on said upper cross member for lengthwise adjustment therealong;

screen clamping means on each of said holding arms releasably and adjustably securing to said holding arms a printing screen for adjustment lengthwise and angularly with respect to the holding arms;

work holding means secured to the intermediate cross member of the main frame;

a workpiece holding member releasably clamped to the work holding means in fixed angular position relative to the main frame, said workpiece holding member having an upper surface and a downwardly extending leg;

said work holding means comprising an upstanding bracket with an upwardly presented aperture therein and horizontally extending clamping means protruding into said aperture;

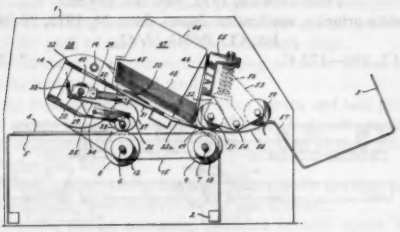
the downwardly extending leg of the workpiece holding member being received in said aperture and releasably securable therein by said clamping means at preadjusted height, so as to permit adjustment of the height of the upper surface of the workpiece holding member relative to the main frame.

4,073,233

PRINT POSITION ADJUSTING APPARATUS FOR ADDRESS PRINTER

Sadaharu Komatsu, Fuchu, Japan, assignor to Scriptomatic, Inc., Philadelphia, Pa.

Filed Nov. 9, 1976, Ser. No. 740,105
Claims priority, application Japan, May 31, 1976, 51-063095
Int. Cl.[2] R41L *11/08*
U.S. Cl. 101—132.5 **1 Claim**



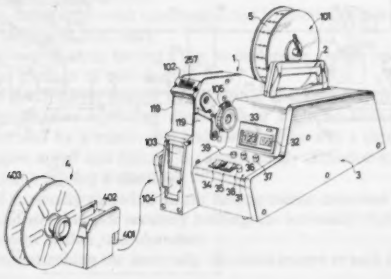
1. A printer comprising roller means for feeding a workpiece on which printed material is to be printed, liquid application roller means for applying a copying liquid on the workpiece being fed, delivery means for delivering a master card on which the printed material is contained, and a pair of print rollers to which said workpiece and said master card are delivered for printing the printed material from the master card to the workpiece, a drive shaft for rotating said roller means and an operating shaft, said operating shaft operatively arranged to operate the said liquid application roller means and said delivery means, and coupling means adjustably coupling said drive shaft to said operating shaft, said coupling means including a first connecting member fixed to said drive shaft and a second connecting member fixed to said operating shaft, one of said connecting members being formed with a tenon and the other of said connecting members being formed with a mortise in which said tenson is rotatably received whereby said first and second connecting members are adjustable for adjusting said drive shaft relative to said operating shaft, said one of said connecting members being formed with a threaded opening and the other of said connecting members being formed with an elongated slot and a set screw received in said slot and said threaded opening for securing said connecting members in an adjusted position whereby said drive shaft and said operating shaft can be fixed in an adjusted position.

4,073,234

PRINTING MACHINE FOR LABEL STRIP, OR THE LIKE

Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Tokyo, Japan

Filed Apr. 21, 1976, Ser. No. 678,760
Claims priority, application Japan, Apr. 26, 1975, 50-050220
Int. Cl.[2] B41F *1/08*
U.S. Cl. 101—288 **7 Claims**



1. A printing machine for feeding and printing labels, or the like, which are arranged in strip form, said machine comprising:

a machine body having a forward and a rearward end and having an exit and an entrance at said forward and said rearward ends, respectively;

a holder for a rolled strip of labels, or the like; said holder being mounted at said body rearward end near said entrance;

a passage for a label strip, said passage extending through said body from said rearward to said forward ends;

a printing device for printing indicia on labels, or the like; said printing device being supported in said body above said passage; types in said printing device facing toward said passage and defining a type face;

a platen in said body in opposed relationship to said type face and normally positioned below said passage; platen raising means connected with said platen for selectively raising said platen toward and against said type face and across said passage, and for thereafter lowering said platen to its said normal position;

a strip advancing device in said body for advancing the strip of labels, or the like, along said passage toward said body exit; said advancing device comprising a pawl projecting into said passage for engaging said strip, and reciprocating means for reciprocating said pawl along said passage;

means for coordinating the motion of said platen and said advancing device for causing said platen to shift to said type face while said pawl is not advancing the strip, for causing the pawl to retract rearwardly in said body while said platen is raised and for causing said pawl to advance the strip while said platen is in its said normal position;

a strip winding device for winding the strip of labels, or the like; said strip winding device being positioned near said body exit and being detachably mounted to said body; said winding device including a reel on which a strip may be wound; means for rotating said reel for winding the strip on it, and a friction clutch connection between said rotating means and said reel;

said rotating means for said reel is electrically operable, a connection to a source of electric power for said rotating means and said connection being located in said body; a mechanical socket, also having an electric socket associated with it and said mechanical and electric socket being together located on one of said body and said winding device; a mechanical plug and also having an electric plug associated with it being located on the other of said body and said winding device; said mechanical and electric sockets and plugs being connectable such that said winding device is mechanically connected with said body simultaneously as said rotation means is electrically connected with said body;

the one of said electric plug and said electric socket in said body being electrically connected with said connection to a source of electric power; the other of said electric plug and said electric socket in said winding device being electrically connected with said reel rotating means.

4,073,235

EXPLOSIVE ENERGY-INITIATABLE BLASTING CAPS CONTAINING A POROUS IGNITION AND DETONATION SYSTEM AND METHOD

Robert Bartley Hopler, Jr., Succasunna, N.J., assignor to Hercules Incorporated, Wilmington, Del.

Filed July 30, 1976, Ser. No. 710,059
Int. Cl.[2] F42D *1/04*; F42B *3/10*
U.S. Cl. 102—22 **19 Claims**

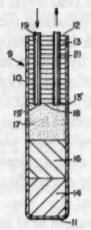
1. A non-electrically initiated blasting cap comprising:

a closed shell, including a plug closure therefor;

an ignition charge in said shell substantially contiguous with said plug closure and initiatable in response to action of explosive energy of an explosive gas mixture, and sufficiently porous and permeable for flow of a gas stream through the interstices thereof;

a first conduit means extending from outside said shell through said plug closure and opening into contiguous contact with said ignition charge so as to convey an explosive gas mixture as a confined stream into ignition position in said interstices for responsive initiation of said ignition charge; and

a second conduit means extending from contiguous contact with said ignition charge to the outside of the said shell,



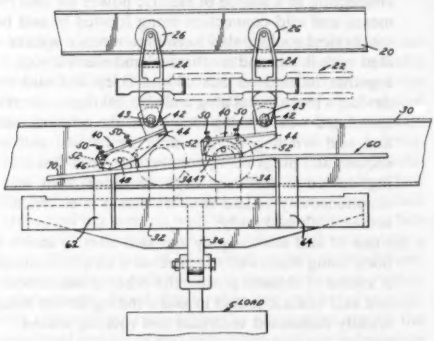
whereby a stream of said explosive gas can be continuously passed from said first conduit means through the interstices of said ignition charge and through said second conduit means to purge and charge said porous ignition charge and thereafter explosive gas in said first conduit means can be ignited for propagation of resulting explosive energy within the interstices of said porous ignition charge for ignition of same.

4,073,236

POWER AND FREE CONVEYOR SYSTEM

Earl J. Harrington, Ferndale, Mich., assignor to Overhead Conveyor Company, Ferndale, Mich.

Filed May 19, 1976, Ser. No. 687,673
Int. Cl.[2] B61B *13/00*
U.S. Cl. 104—172 S **5 Claims**



1. A power and free conveyor system which comprises:

(a) a power track and a drive chain supported to move along said track,

(b) a carrier track mounted colinearly with said power track,

(c) a plurality of dogs on said drive chain having a limited pivotal relation thereto,

(d) a magnet device on an exterior surface of each said dog,

(e) a load car movably supported on said carrier track,

(f) a ramp surface of magnetically attractable material mounted on said load car having a disposition generally aligned with the direction of said carrier track,

said dog being disposed relative to said ramp surface to bring said magnets into contact with said surface to cause acceleration of said load car to the velocity of said drive chain, and

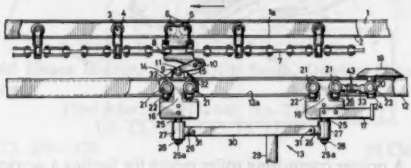
(g) said magnet devices comprising U-shaped pieces having spaced ends with surfaces lying in a plane, and means to mount said pieces for limited motion around the bight to insure proper contact with a ramp surface.

4,073,237

POWER AND FREE CONVEYOR WITH PUSHER DISENGAGING MEANS OPERABLE ON CURVED SECTIONS OF CONVEYOR TRACK

Takao Wakabayashi, Toyonaka, Japan, assignor to Nakanishi Conveyors Co. Ltd., Kanagawa, Japan

Filed June 24, 1976, Ser. No. 699,582
Claims priority, application Japan, June 24, 1975, 50-79028
Int. Cl.[2] B65G *17/42*
U.S. Cl. 104—172 C **7 Claims**



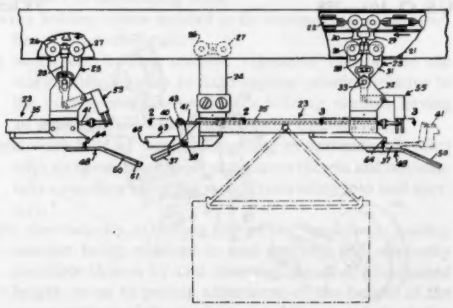
1. In a power and free conveyor including a plurality of upwardly and downwardly pivotable pushers spaced apart by a predetermined distance and attached to a drive chain on a power line, a dog mounted on each of a plurality of carriers on a free line and engageable with the pusher, and pusher raising cams respectively mounted on the carriers and each provided at its rear end with a recess for receiving the dog, the improvement wherein each of the carriers includes at least one main free trolly, a subfree trolley positioned to the rear of the main free trolley, the main free trolley having at least two pairs of vertical rollers for supporting the main free trolley on the free line and the subfree trolley having only one pair of vertical rollers for supporting the subfree trolley on the free line, and a universal joint coupling the subfree trolley to the main free trolley, wherein the dog is mounted on the main free trolley and the pusher raising cam is mounted on the subfree trolley and wherein when said subfree trolley is located on a curve on the free line the pusher raising cam is aligned substantially parallel to the tangent to the line.

4,073,238

POWER AND FREE CONVEYOR WITH ENGAGING MEANS OPERABLE ON VERTICALLY CURVED SECTIONS OF TRACK

Kenneth F. Knudsen, St. Clair Shores, Mich., assignor to American Chain & Cable Company, Inc., Bridgeport, Conn.

Filed June 16, 1976, Ser. No. 696,576
Int. Cl.[2] B61B *10/00*
U.S. Cl. 104—172 S **24 Claims**



17. A carrier comprising spaced trolleys and means intercon-

necting said trolleys a conveyor having longitudinally spaced pusher and holdback dogs mounted thereon,

a trailing trolley having a pusher movably mounted thereon for movement into and out of the path of the pusher and holdback dogs on the conveyor,

a bumper,

said bumper being movably mounted on the leading portion of said carrier and adapted to engage a preceding carrier or an obstacle,

and means interconnecting said bumper and said retractable pusher and operable upon engagement of the bumper with the preceding carrier or obstacle to move said pusher out of the path of said pusher and holdback dogs,

said last-mentioned means comprising actuator means movably mounted on said trolley,

means interconnecting said actuator means and said pusher,

and means interconnecting said bumper and said actuator,

said actuator means being pivoted to said trolley about a horizontal axis,

said rear trolley comprising an upper body portion and a lower body portion pivoted to one another,

said pusher being movably mounted in said upper body portion,

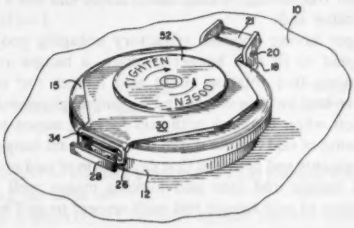
said actuator means being pivoted on said lower body portion.

4,073,239

CLOSING MEANS FOR A HATCH COVER

Franklin P. Adler, Michigan City, Ind., assignor to Apex Railway Products Co., Chicago, Ill.

Filed Sept. 20, 1976, Ser. No. 724,644
Int. Cl.² B61D *39/00*; B65D *45/28*
U.S. Cl. 105—377 **8 Claims**



1. Cover means for a hatch opening comprising:

a hatch cover;

hinge means providing for pivotal opening and closing movement of said hatch cover;

a locking strap having lip means overlapping and extending beyond the hatch cover and said locking strap having means attached to said hinge means;

retainer means for attachment to the lip means of said strap for securing the strap in a locked position;

a rotatable hand wheel;

a threaded shaft with means attached to said hand wheel for rotation of said shaft;

said locking strap having a top, an underside, and an opening for passage of said shaft;

said hatch cover having a hub with a chamber therein;

said chamber including closed sides, a closed lower end formed by a removable end cover piece and a threaded open upper end formed by an internally threaded means;

said hub having a shoulder;

said internally threaded means having means mounted upon said shoulder for securely holding the internally threaded means within said chamber;

means attaching the internally threaded means to said shoulder;

said shaft having threaded means extending through the internally threaded means for movement of the shaft into and from the chamber when the shaft is rotated;

said rotatable hand wheel having means adjacent the top side of said locking strap and engageable therewith for urging the locking strap downwardly;

thrust means attached to said shaft adjacent the underside of said locking strap and opposite the hand wheel for urging the locking strap upwardly; and,

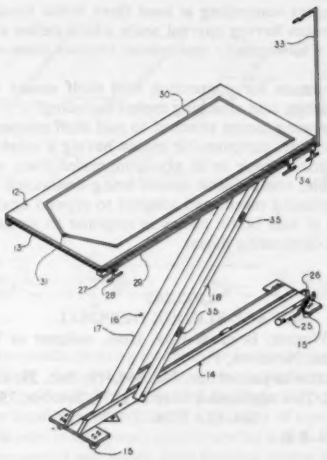
said thrust means and said internally threaded means being spaced apart a first distance when in the locked position and said first distance increasing to a greater distance upon rotation of the hand wheel in one direction whereby the thrust means engages the underside of the locking strap forcing apart the internally threaded means and thrust means to urge the hatch cover down to close off said hatch opening.

4,073,240

PORTABLE ANIMAL HOSPITAL TABLE

Howard G. Fly, Box 63, Ovando, Mont. 59854

Filed Nov. 2, 1976, Ser. No. 737,903
Int. Cl.² A47B *9/00*
U.S. Cl. 108—20 **9 Claims**



1. A portable adjustable animal hospital table comprising a plastic bed surface disposed on an upper frame, a radiation shielding layer positioned below said plastic bed surface and carried by said upper frame, a base frame supported on rolling means, pivotally mounted linkage means operatively connecting said upper frame and said base frame, a pressure cylinder and piston mounted on said base frame and pivotally connected to said linkage means, and means for actuating said pressure cylinder and piston, said base frame including two spaced longitudinally extending members, said linkage means including a central support member and side stabilizing members spaced closely adjacent to said central support member, said central support member being pivotally connected between said longitudinally extending members of said base frame and said side stabilizing members being pivotally connected to the outer sides of said longitudinally extending members of said base frame, the pivotal connections of said central support member and said side stabilizing members with said longitudinally extending members being spaced from each other along said longitudinally extending members in a substantially horizontal plane, and the opposite ends of said central support member and said side stabilizing members being pivotally connected to said upper frame in a similar spaced relationship in a second horizontal plane, and said piston being pivotally connected to the end of said central support member which is

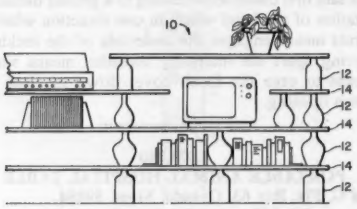
pivotally connected to said longitudinally extending members of said base frame.

4,073,241

BOTTLE SUPPORTED SHELF APPARATUS

Richard J. Wheeler, 17 Ferguson Road, Warren, N.J. 07060

Filed July 29, 1976, Ser. No. 709,838
Int. Cl.[2] A47B 57/00
U.S. Cl. 108—91 **14 Claims**



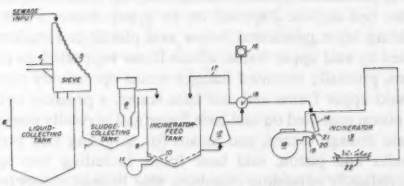
1. A shelf apparatus comprising:
shelf means;
support means comprising at least three bottle means, said bottle means having internal walls which define a cavity having a substantially continuous circular cross-section; and,
attaching means for connecting said shelf means to said bottle means, said attaching means including:
a compressing means attached to said shelf means; and,
an expansible, compressible means having a substantially cylindrical shape in its non-compressed state, said expansible, compressible means being connected to said compressing means and adapted to expand against the walls of said bottle means in response to actuation of said compressing means.

4,073,242

SEWAGE SLUDGE DISPOSAL

William F. Wagner, Brigham City, Utah, assignor to Thiokol Corporation, Newtown, Pa.

Continuation-in-part of Ser. No. 644,479, Dec. 29, 1975, abandoned. This application May 9, 1977, Ser. No. 795,047
Int. Cl.[2] F23G 5/02
U.S. Cl. 110—8 R **4 Claims**



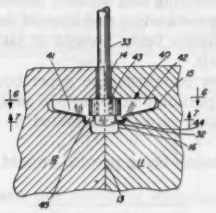
1. The method for sewage sludge disposal comprising:
Draining the liquid content from the sludge with a sieve;
grinding the sludge;
agitating the sludge in a tank to maintain uniform consistency and density thereof;
pumping the sludge from the tank through a first pipe that discharges the sludge back into the tank, at a velocity great enough to avoid clogging the pipe;
periodically diverting the sludge from the first pipe into a second pipe, so that the required flow velocity of the sludge in the second pipe is maintained but the average volumetric rate of sludge flow in the second pipe is less than the output of the first pipe; and
discharging the sludge from the second pipe and spraying it in periodic spurts into an incinerator by means of forced air, whereby the average volume of sludge delivered per unit of time to the incinerator is less than that flowing through the first pipe, so that the incinerator can be smaller than would be necessary if the full output from the first pipe were delivered thereto.

4,073,243

INDUSTRIAL FURNACE ROOF ASSEMBLY AND COMPONENTS THEREOF

Frank P. Merkle, Jr., Barrington, Ill., assignor to Merkle & Associates, Inc., Palatine, Ill.

Filed Dec. 1, 1976, Ser. No. 746,322
Int. Cl.[2] F23M 5/04
U.S. Cl. 110—99 R **12 Claims**



1. A high temperature industrial furnace roof assembly comprising:
two refractory bricks having adjacent faces, opposing hanger recesses, locking means well beneath said recesses, hanger rod hole extending from said recesses to the exterior of the top of said assembly, said refractory bricks held in adjacent position by securement means;
a hanger rod having locking means at one end and a hook at the other end;
a hanger having opposed refractory engaging projections adapted to fit said hanger recesses, a hanger rod hole allowing free rotation about said hanger rod one end above said locking means and locking engagement means which when engaged with said locking means prevents rotation of said hanger rod in relation to said hanger at 90° increments and provides that depression of said one end of said hanger rod into said locking means well permits rotation of said hanger rod with respect to said hanger.

4,073,244

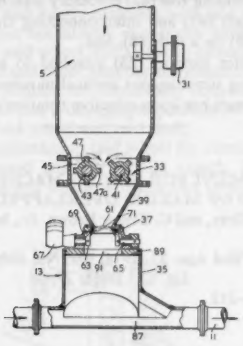
MATERIAL HANDLING APPARATUS

Brian Snowdon, Doncaster, England, assignor to Macawber Engineering Limited, England

Filed June 3, 1976, Ser. No. 692,423
Claims priority, application United Kingdom, June 9, 1975, 24642/75
Int. Cl.[2] F23J 1/00, 3/00
U.S. Cl. 110—165 R **4 Claims**

1. Material handling apparatus comprising
a pipeline or the like,
means connected to the pipeline for supplying intermittent blasts of high pressure compressed air to the pipeline,
a material outlet at one end of said pipeline, and
at least two material inlet members located between said compressed air supply means and said material outlet. each material inlet member being in the form of a chamber opening at the bottom end thereof into the pipeline and extending upwardly from the pipeline, said chamber having in its upper part a spherical closure member which is movable between an open position at which material may be passed into the chamber and a closed position at which material is prevented from passing into the chamber, said chamber being further provided with an annular seal which is mounted for movement to engage with said

closure member when said closure member is in its closed position, thereby providing an air tight seal to prevent



leakage of compressed air from the pipeline via said inlet member.

4,073,245

LEVEE FORMING APPARATUS AND METHOD

Everett Anderson, Box 812, Eagle Lake, Tex. 77434

Filed May 13, 1976, Ser. No. 686,163

Int. Cl.[2] A01C *5/06, 7/08;* **A01B** *49/04*

U.S. Cl. 111—1 **18 Claims**

1. A method of forming a levee in a field planted with seed, comprising the steps of:

forming a plurality of laterally spaced borrow ditches by removing earth from the ditches without disturbing the ground surface between the laterally spaced ditches;

transporting the removed earth to a predetermined location without disturbing the ground surface between the laterally spaced ditches;

depositing the earth which was removed from the plurality of ditches at the predetermined location;

working the deposited earth to form a levee having a substantially uniform shape without dips and weak spots;

planting the field with seed prior to forming the plurality of laterally spaced ditches and forming the ditches prior to germination of the seed to provide a stand of the crop on the undisturbed ground surface between the laterally spaced ditches;

planting additional seed in the deposited earth forming the levee to provide an adequate stand to maintain a good yield across the levee;

the step of planting additional seed includes adding the seed with the removed earth prior to depositing the earth to form the levee; and

the step of forming the laterally spaced ditches including forming at least two ditches on each of the two sides of the predetermined location and forming the levee at the predetermined location without disturbing the ground surface at the space between each two ditches at each side of the levee.

4,073,246

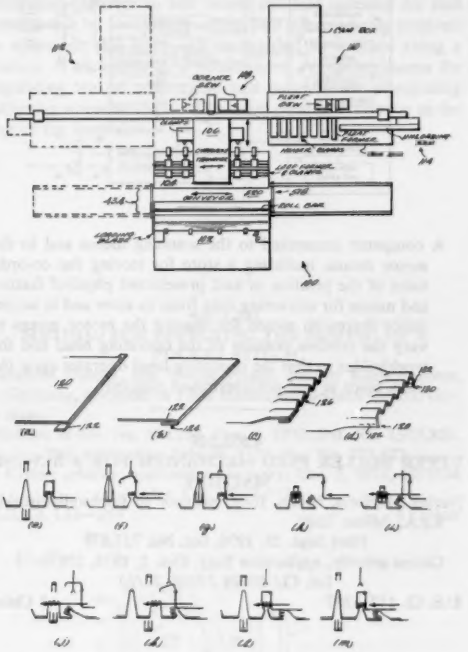
PLEATING MACHINE

William B. Crawford, Greensboro, and Anthony T. Solomon, Reidsville, both of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Sept. 3, 1975, Ser. No. 610,045

Int. Cl.[2] D05B *35/08*

U.S. Cl. 112—121.11 **27 Claims**



1. An automatic pleating machine for forming pleated drapes from a blank drapery panel comprising loading means for receiving the leading top edge of said panel, loop forming means for simultaneously forming a plurality of equally spaced and sized loops in said panel, corner sewing means for seaming the top corners of said panel, pleat forming means for forming pleats within each of said loops, pleat sewing means for sewing the pleats, transfer means for moving said panel from said looping means to said corner sewing means and thereafter to said pleating means while maintaining the loops in their formed condition and control means for controlling the handling of said panel through said machine.

4,073,247

AUTOMATIC MACHINES

Sinclair Upton Cunningham, and Douglas Jackson, both of Glasgow, Scotland, assignors to The Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Dec. 23, 1975, Ser. No. 643,834

Claims priority, application United Kingdom, Dec. 23, 1974, 55634/74

Int. Cl.[2] D05B *21/00*

U.S. Cl. 112—121.12 **11 Claims**

1. An automatic machine for operating upon a work piece at a predetermined position with respect to a preselected physical feature of the work piece comprising:

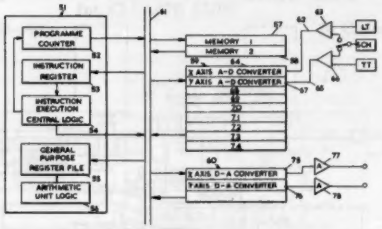
A work holder for holding a work piece,

Scanning means including a scanning head for scanning the work piece located in the work holder and for determin-

ing with respect to a predetermined coordinate system the co-ordinates of the preselected physical feature and for producing signals representative of said co-ordinates,

An operating head for operating upon the work piece,

Motor means for varying the relative positions of the operating head and the work holder, and



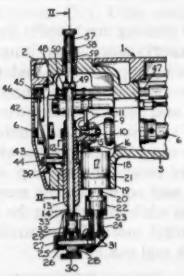
A computer, connected to the scanning means and to the motor means, including a store for storing the co-ordinates of the position of said preselected physical feature and means for extracting data from its store and in accordance therewith means for causing the motor means to vary the relative position of the operating head and the workholder so that the operating head operates upon the work piece at said predetermined position.

4,073,248

UPPER ROLLER FEED MECHANISM FOR A SEWING MACHINE

Nerino Marforio, Milan, Italy, assignor to Rockwell-Rimoldi, S.p.A., Milan, Italy

Filed Sept. 29, 1976, Ser. No. 727,878
Claims priority, application Italy, Oct. 2, 1975, 27870/75
Int. Cl.² D05B *27/06, 27/10*
U.S. Cl. 112—207 **1 Claim**



1. An upper roller feed mechanism for sewing machines of the type including a lower feed mechanism operatively associated with an upper feed mechanism with a presser mechanism having a presser bar mounted in the head of the machine for positioning an upper feed roller adjacent said machine's presser foot, the improvement comprising:

(a) a rotatably driven shaft (6) supported within the sewing machine;

(b) an eccentric (7) mounted on said shaft (6) having a rod (8) fixed thereto for converting rotary movement of said shaft to oscillating movement;

(c) means defining a one-way clutch (17) interconnecting the upper feed roller (28) with said rod (8) for changing the oscillating movement of the latter to effect incremental unidirectional rotary movement of said roller;

(d) lifting means within the head for raising the feed roller (28) with the presser bar which includes:

(i) a selectively rotatable shaft (47) having a lever (48) fixed thereon in operative association with an arm (49) fixed on the presser bar;

(ii) a depending rod (42) pivotably attached at one end to said shaft (47) and interconnecting the latter with an arm (39) on a rod (38); and

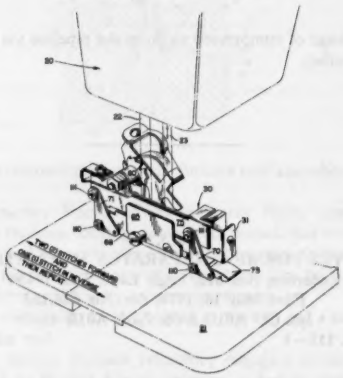
(iii) a roller support (25) attached to said rod (38) for effecting simultaneous vertical movement thereof with the presser bar upon selective rotation of said shaft (47).

4,073,249

ATTACHMENT FOR SEWING MACHINES AND A METHOD OF MAKING OVERLAPPED STITCHES

Dennis A. Mulkey, and C. Kepler Brown, Jr., both of Richmond, Va.

Filed Apr. 27, 1976, Ser. No. 680,862
Int. Cl.² D05B *27/04*
U.S. Cl. 112—212 **17 Claims**



1. An attachment for use with a sewing machine, wherein the sewing machine has a reciprocating needle member with an accessory attaching member adjacent the needle, and wherein the sewing machine has at least one intermittently engaged feed dog disposed opposite said needle for advancing fabric being sewn, said attachment comprising:

means for mounting the attachment on the accessory attaching member;

a first movable member on the attachment;

means for coupling the first movable member to the needle to cycle, while the needle reciprocates;

reversing means for engaging the fabric from the top and for reversing the direction of advance of the fabric; and

means disposed between said movable member and said reversing means for activating said reversing means after two cycles of said movable member to thereby form three overlapped stitches for each advance of one stitch length.

4,073,250

INTERMITTENT DRIVE FOR SEWING MACHINE

Noboru Kasuga, Hachioji, Japan, assignor to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Mar. 24, 1976, Ser. No. 668,565
Claims priority, application Japan, Mar. 27, 1975, 50-36115
Int. Cl.² D05B *69/22*
U.S. Cl. 112—274 **15 Claims**

1. A sewing machine comprising:

a housing;

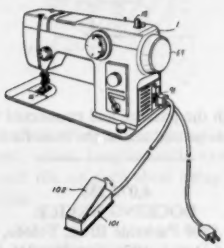
a needle on said housing displaceable between a down position engaging through a workpiece and an up position disengaged therefrom;

a drive shaft on said housing operatively connected to said needle;

a drive wheel on said shaft rotatable thereon relative to said shaft;

means including a clutch having one clutch member mounted on and jointly rotatable with said shaft, another clutch member operatively engageable between said one member and said wheel, and a control element operatively connected to said other member and displaceable between an engaged position for rotationally coupling said wheel and said shaft and a disengaged position for free relative rotation of said wheel and said shaft;

drive means connected to said wheel for rotating same and, in said engaged position of said clutch, for vertically reciprocating said needle between said up and down positions;



means including a formation on said shaft and a stopper on said housing displaceable between an operative position engageable with each other for stopping rotation of said shaft in a predetermined angular position corresponding to said up position and an inoperative position unengageable with each other;

means for displacing said control element from said engaged to said disengaged position on engagement of said stopper in said operative position with said formation, whereby said shaft can be arrested in said predetermined angular position and is substantially simultaneously rotationally uncoupled from said wheel; and

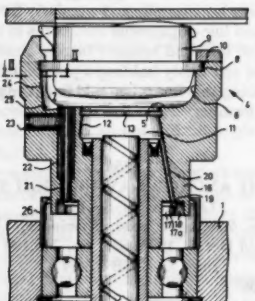
means for substantially simultaneously displacing said control element into said engaged position and said stopper into said inoperative position.

4,073,251

LUBRICATING DEVICE FOR A ROTARY LOOPTAKER

Reinhold Schrudde, Bielefeld, Germany, assignor to Kochs Adler AG, Bielefeld, Germany

Filed Mar. 24, 1977, Ser. No. 780,758
Int. Cl.[2] D05B *71/00*
U.S. Cl. 112—256 **8 Claims**



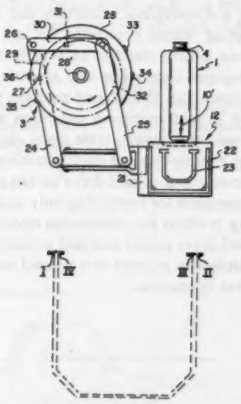
1. A lubricating device for the raceway of the bobbin case of a rotary sewing machine looptaker, comprising: a driven hollow shaft carrying said looptaker; a body with a recess formed by a bottom and a substantially cylindrical sidewall for holding the bobbin case; a hub on said body; an oil collecting chamber in said hub and having an annular cavity with an undercut inside peripheral area; an oil line in said body for leading oil supplied from an oil reservoir via said hollow shaft to said oil collecting chamber; a conduit for leading oil from said oil collecting chamber to said recess and said raceway for said bobbin case by centrifugal action, said conduit being received in a bore in said body and surrounded by a space along a portion of its length by a counterbore; regulating means for regulating the oil delivery to said raceway and comprising adjusting screw means for tilting said conduit in relation to the axis of the looptaker.

4,073,252

METHOD FOR EFFECTING THE SEWING OF A POCKET STITCH

Reinhold Dobner, and Walter Hager, both of Kaiserslautern, Germany, assignors to Pfaff Industriemaschinen GmbH, Germany

Division of Ser. No. 638,184, Dec. 5, 1975, Pat. No. 3,983,825.
This application July 15, 1976, Ser. No. 705,423
Claims priority, application Germany, Dec. 5, 1974, 2457534
Int. Cl.[2] D05B *3/12*
U.S. Cl. 112—265 **4 Claims**



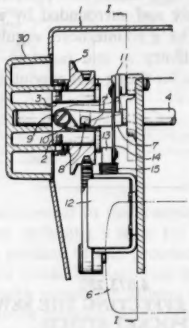
1. A method of effecting the sewing of a pocket piece on a workpiece which is guided by a separately driven guide into operative association with a reciprocating needle of a sewing machine operative independently of the guide and which effects both a straight stitch when it is reciprocated and a zig zag stitch when it is swung backwardly and forwardly, comprising guiding the workpiece so as to form at least one substantially U-shaped straight stitch having spaced apart leg portions, and securing the straight stitch by guiding the workpiece to effect the formation of a barring stitch at the end of each leg portion of the straight stitch while moving the needle in a swinging motion to effect the formation of a zig zag stitch and in a manner to cause the starting and finishing ends of the bars to be located substantially in the center of the bar.

4,073,253

INTERMITTENT STITCHING DEVICE OF SEWING MACHINES

Yasukata Eguchi, Kunitachi, Japan, assignor to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Apr. 23, 1975, Ser. No. 570,701
Claims priority, application Japan, May 2, 1974, 49-48757
Int. Cl.[2] D05B *69/22*
U.S. Cl. 112—275 14 Claims



1. In a sewing machine of the type having both continuous and intermittent modes of operation, a combination comprising means for mounting a top shaft for rotation in the machine; energizable drive means for rotating the shaft; coupling means intermediate the shaft and said drive means and being movable between a disengaged state in which intermittent operation occurs, and an engaged state in which said drive means is in motion-transmitting engagement with the shaft for continuous operation; energizable actuating means having an armature movable between a deenergized condition and an energized condition; decoupling means connected to and movable by said armature from a first position in which said coupling means is in said engaged state when said actuating means is in said deenergized condition, to a second position in which said actuating means is in said energized condition and said coupling means is in said disengaged state upon elapse of a time interval following energization of said actuating means; and switching means connected to said drive means and said actuating means and operative for energizing only said drive means in a first switching position for continuous operation, and for energizing both said drive means and said actuating means in a substantially simultaneous manner in a second switching position for intermittent operation.

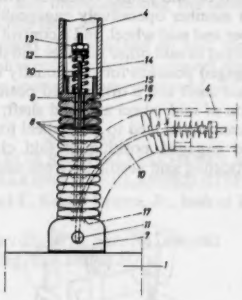
4,073,254

SAILING MAST FOR SAILING BOARDS

Hannes Marker, Hauptstrasse 51-53, 81 Garmisch-Partenkirchen, Germany

Filed July 2, 1976, Ser. No. 702,084
Claims priority, application Germany, July 4, 1975, 2530020
Int. Cl.[2] B63B *15/02*
U.S. Cl. 114—90 5 Claims

1. A sailing mast for sailing boards which can be manually tilted and rotated during sailing, comprising a mast having a flexible lower portion, support means for supporting said mast on the sailing board comprising a mast foot, a resilient mounting means for interconnecting said mast to said mast foot, wherein said flexible lower portion comprises a row of superposed annular discs wherein the apertures of said discs define a passage, and wherein said discs converge towards the outside, said resilient mounting means comprises a rope, said rope



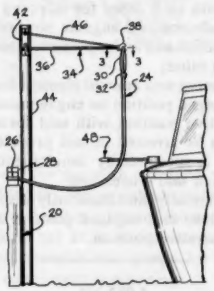
extending through the passage and connected to the adjoining mast portion at its one end and to the mast foot at its other end.

4,073,255

DOCKING DEVICE

William A. Paul, 1808 Parkside Blvd., Toledo, Ohio 43607

Filed Dec. 1, 1976, Ser. No. 746,496
Int. Cl.[2] B63B *21/00*
U.S. Cl. 114—230 10 Claims



7. Apparatus for aiding in docking a boat to a stationary dock member or the like, said apparatus comprising, in combination, a line-engageable member, means for mounting said line-engageable member on the boat in at least one extended, line-engageable position, said mounting means including a flexible arm connected to said line-engageable member and extending generally horizontally and angularly from the side of the boat when said line-engageable member is in the extended position, a flexible line, and resilient fingers attachable to the dock member for releasably holding a portion of said flexible line and for releasing said line when said line is engaged by said line-engageable member.

4,073,256

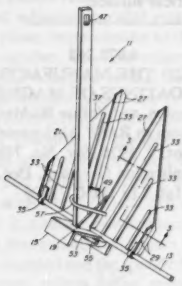
LIGHTWEIGHT ANCHOR HAVING HIGH STRENGTH TO WEIGHT RATIO

Alfred P. Rossini, 6 Belmore Road, Framingham, Mass. 01701

Filed Dec. 1, 1976, Ser. No. 746,100
Int. Cl.[2] B63B *21/44*
U.S. Cl. 114—306 11 Claims

1. A lightweight anchor comprising:
   a. a stock,
   b. a crown mounted on the stock,
   c. a shank mounted on the stock, and
   d. a pair of flukes mounted on the stock, one on each side of the shank, the flukes and shank being pivotally movable

relative to each other, each fluke comprising two sheets of metal of the same size and shape, stacked one on top of the other, in alignment with one another and laminated together, each sheet of metal containing a plurality of integrally formed, raised, longitudinally extending, strengthening ribs, said ribs on each sheet being raised in an outward direction.

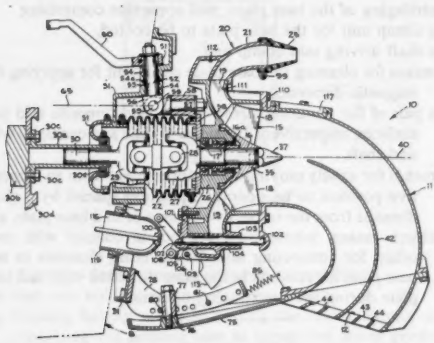


4,073,257

MARINE PROPULSION SYSTEM

Waldo E. Rodler, Jr., San Jose, Calif., assignor to Turbo Engineering Corporation, Signal Hill, Calif.

Filed July 26, 1976, Ser. No. 708,500
Int. Cl.[2] B63H *11/00*
U.S. Cl. 115—12 R 14 Claims



1. A jet propulsion system for mounting on the transom of a water vehicle, comprising:

a. an intake duct;

b. duct support means for supporting said intake duct for movement between an upward tilt angle and downward tilt angle;

c. means connected to said duct support means and defining a reaction center line to urge said duct in a downward tilt angle through a downward propulsive thrust;

d. means connected to said duct support means and defining a thrust center line disposed below the reaction center line to urge said duct in an upward tilt angle through an upward reactive force;

e. a fixed member; and

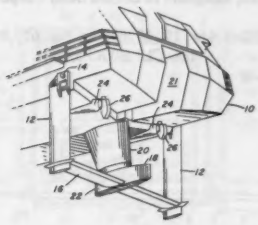
f. a spring interconnecting said intake duct and said fixed member for regulating the tilt angle movement of said intake duct in the changeover between the upward tilt angle and the downward tilt angle.

4,073,258

LATERAL MANEUVERING CONTROL FOR WATER-JET PROPULSION SYSTEMS

James H. Logan, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 7, 1977, Ser. No. 785,433
Int. Cl.[2] B63H *11/10*
U.S. Cl. 115—12 R 8 Claims



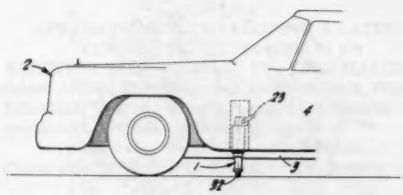
1. In a watercraft having a propulsion system including two generally parallel water jets directed rearwardly of the craft, each of said jets having associated therewith deflector means for controlling the angular direction of the jet and thrust reverser means for reversing the direction of the jet thrust, control means for said deflector means for normally maintaining the jets parallel to each other and for moving both deflectors means together to simultaneously change the direction of the jets, said control means also including means for moving the deflector means in opposite directions to divergent positions such that the jets diverge at equal angles relative to the center line of the craft, and control means for independently positioning each of said thrust reverser means, whereby the thrust of one of the jets may be reverser means, whereby the thrust of one of the jets may be reversed while the jets are in said divergent position to effect lateral movement of the craft.

4,073,259

AUTOMOTIVE THEFT SIGNALLING DEVICE

Howard J. McCoy, 1538 E. 9th St., Stockton, Calif. 95206

Filed Jan. 7, 1977, Ser. No. 757,741
Int. Cl.[2] B60R *25/10*
U.S. Cl. 116—33 10 Claims



1. An automobile theft signalling device comprising a post unit, means adapted to mount the post unit on an automobile within the confines of the body thereof but with the lower end of the post unit exposed in the direction of the road, said post unit being vertically adjustable between a normally raised out-of-use position clear of the road and a lowered, working position with the lower end of the post unit adjacent the road, a wheel journaled on the lower end of the post unit and running in engagement with the road in said working position of the post unit, and means coacting responsive to rotation of the wheel operative to produce a sound which is heard from exteriorly of the automobile, and means manually actuated from within the automobile to vertically adjust the post unit to

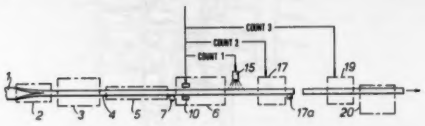
dispose the same in said out-of-use position, or working position, selectively.

4,073,260

APPARATUS FOR REMOVING CROSS WELDS FROM METAL TUBES AND MARKING THE SAME

Clive J. Bosworth; Neil E. Bridgstock, both of Kettering; Raymond S. Stone, Corby, and William L. McLaughlin, Kettering, all of England, assignors to British Steel Corporation, London, England

Filed Apr. 19, 1976, Ser. No. 677,868
Int. Cl.[2] B05C *5/00*
U.S. Cl. 118—8 3 Claims



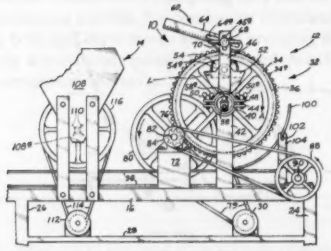
1. Apparatus for removing cross welds from a metal tube moving continuously longitudinally along a path, comprising: means for detecting the presence of cross welds in the tube, cutting means operable to sever said tube, pulse generating means for generating signals representative of predetermined linear movements of the tube, counter means connected to receive pulses from the pulse generating means, and operable in response to a cross weld being detected by said detection means and thereafter in response to a predetermined number of signals being received to actuate said cutting means for removing from said tube a length containing said detected cross weld, said detection means comprising at least two probes positioned about the circumference of the moving tube and operable only simultaneously to relay a signal to said counter means upon a cross weld being detected.

4,073,261

ARTICLE MOISTENER

Samuel J. Teeny, and Parry S. Teeny, both of 1210 SE. 179th, Portland, Oreg. 97233

Filed Sept. 27, 1976, Ser. No. 726,829
Int. Cl.[2] B05C *1/02, 5/00*
U.S. Cl. 118—16 11 Claims



1. Apparatus for applying liquid to one side of a substantially flat article comprising:

power-driven drum means rotatable about a generally horizontal axis and having a perforate, cylindrical surface for receiving an article on the surface and transporting it for a portion of a drum revolution;

roller means rotatably disposed within the interior of said drum means and adapted to receive liquid, said roller means arranged for continuous contact with the inside of said cylindrical surface so that rotation of said drum means imparts relative rotation to said roller means; and

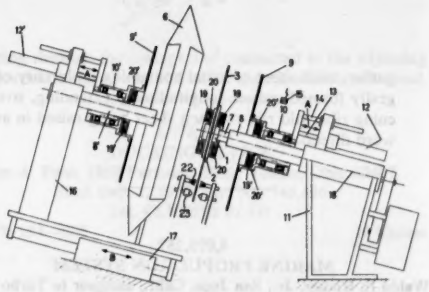
liquid regulating means including a pressure member operable for pressing a portion of said cylindrical surface against said roller means to selectively squeeze and thereby transfer liquid from said roller means to the outside of said cylindrical surface, said liquid regulating means also including guide means for guiding the article onto said cylindrical surface.

4,073,262

APPARATUS FOR THE MANUFACTURE OF THE MAGNETIC COATINGS OF MAGNETIC DISKS

Dieter Scheffel, Neuhofen, and Volker Richter, Heidelberg, both of Germany, assignors to BASF Aktiengesellschaft, Germany

Filed Nov. 9, 1976, Ser. No. 740,088
Claims priority, application Germany, Dec. 5, 1975, 2554692
Int. Cl.[2] B05C *11/08*
U.S. Cl. 118—52 5 Claims



1. An apparatus for the manufacture of the magnetic coatings of magnetic disks by application of a pourable magnetic dispersion to both surfaces of a rotating base plate, followed by centrifuging of the base plate, said apparatus comprising

a clamp unit for the base plate to be coated,

a shaft driving said clamp unit,

means for cleaning the base plate and a unit for applying the magnetic dispersion,

a pair of flat covering elements mounted opposite said two surfaces, respectively, of said base plate and coaxially with said shaft,

means for axially moving each said element from an inoperative position to an operative position spaced by a short distance from the respective surface of said base plate, and

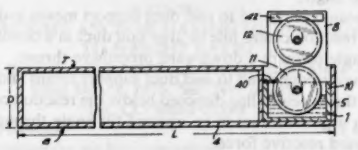
clutch means, whose parts are not in contact with each other, for connecting said flat covering elements to said base plate for rotation in the same direction with said base plate during the centrifuging operation.

4,073,263

LIQUID ADHESIVE COATING MACHINE

Baxter Wayne Melton, 509 Rahway Ave., Westfield, N.J. 07090

Filed May 10, 1976, Ser. No. 684,474
Int. Cl.[2] B05C *1/08*
U.S. Cl. 118—249 9 Claims



1. A liquid adhesive coating machine for coating pressure sensitive liquid adhesive on one surface of a sheet of material, said liquid adhesive coating machine comprising

a support member having a length, a width, a depth, a top, a

bottom, a pair of spaced opposite ends and a pair of spaced opposite sides, and a trough formed therein at one end thereof extending from the top and from side to side, said trough containing liquid adhesive;

first and second rollers rotatably mounted in the machine in closely spaced adjacent parallel relation with their axes disposed in a plane perpendicular to the top and bottom of the support member, the first roller being partially immersed in liquid adhesive in the trough and the second roller being positioned above the first, each of said first and second rollers having a substantially cylindrical surface having a plurality of substantially circular notches formed therein in next-adjacent equidistantly spaced relation, each of said notches having a sustantially V-shaped cross-section whereby the surface of each of said first and second rollers is a substantial sawtooth, the outer surface of each of the first and second rollers between the notches therein being rounded and the rounded outer surfaces of the first and second rollers being substantially coplanarly aligned; and

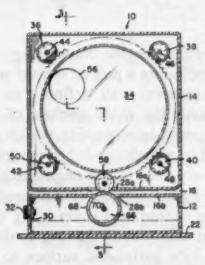
rotating means affixed to one of the rollers for rotating said one of said rollers thereby rotating the other of the rollers in the opposite direction and moving a sheet of material between said rollers in a direction parallel to the top of the support member and simultaneously applying liquid adhesive to one surface of the material via the first roller.

4,073,264

DEVICE FOR IMPREGNATING PAPER

Ronald M. Stephens, 305-1400 Camosun, Victoria, British Columbia, Canada (V8V 4L4)

Filed Feb. 18, 1977, Ser. No. 770,240
Int. Cl.[2] B05C *1/02*
U.S. Cl. 118—250 **7 Claims**



1. A device for impregnating paper comprising:

a reservoir holding an impregnating solution,

a housing having a slot extending the width thereof and separating the housing into an upper and lower portion, the lower portion of the housing forming said reservoir for the impregnating solution,

a first roller having a resilient material covering the periphery thereof rotatably mounted in the lower portion of the housing so as to contact the solution, a portion of the periphery of the roller extending into the slot,

a second roller mounted directly opposite the first roller rotatably mounted in the upper portion of the housing with a portion of its periphery extending into the slot and engaging and driving the first roller,

a circular plate of considerably greater diameter than the second roller rotatably mounted in the upper portion of the housing having means to drive the second roller,

idler rollers rotatably mounted in the upper portion of the housing and spaced about and engaging the periphery of the circular plate to support the circular plate for rotation, and

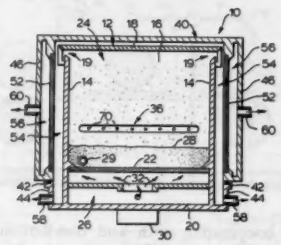
means for manually engaging the circular plate for rotation thereof.

4,073,265

ELECTROSTATIC POWDER COATING APPARATUS

Jorg-Hein Walling, St. Hubert, and John Alan Jukes, Pierrefonds, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 15, 1976, Ser. No. 677,222
Int. Cl.[2] B05B *5/02*
U.S. Cl. 118—634 **5 Claims**



1. In an electrostatic fluidized bed coater having a housing enclosing a plenum chamber and a cloud chamber separated from the plenum chamber by a porous floor plate:

a cover enclosing at least the upper portion of the housing and spaced therefrom;

a porous wall plate spaced from the housing and from the cover to provide an inner exhaust chamber and an outer exhaust chamber respectively;

at least one aperture in the upper portion of the housing opening from the cloud chamber into the inner exhaust chamber;

means to draw air from the outer exhaust chamber;

means to remove powder from the inner exhaust chamber; and

means to pass pressurized air through the porous wall plate into the inner exhaust chamber whereby powder adhering to the wall plate is removed therefrom;

the means to pass pressurized air into the inner exhaust chamber comprising an elongated cup member located in the outer exhaust chamber and bearing against the porous wall plate, the cup member being movable over the face of the wall plate, and means to introduce pressurized air into the cup member.

4,073,266

APPARATUS FOR DEVELOPING A LATENT ELECTROSTATIC IMAGE ON AN ELECTROPHOTOGRAPHIC COPYING MATERIAL

Reinhold Arneth, Budenheim, and Rudi Schwandt, Wiesbaden-Erbenheim, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 17, 1976, Ser. No. 658,504
Claims priority, application Germany, Feb. 20, 1975, 2507221
Int. Cl.[2] G03G *15/10*
U.S. Cl. 118—647 **8 Claims**

1. An apparatus for developing a latent electrostatic image on an electrophotographic copying material by means of a toner dispersion, the apparatus comprising:

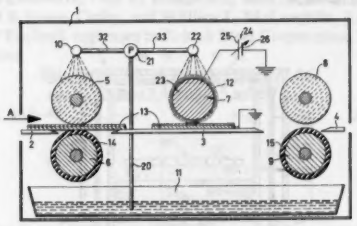
a. infeed means for applying the toner dispersion to the copying material;

b. distribution means for the toner dispersion, said distribution means being disposed downstream of said infeed means in the direction of image development, said distribution means having a surface of soft, porous, and non-conductive material for contacting the copying material, said soft surface covering a metal portion of said distribution means;

c. a controllable voltage source having a first electrode electrically connected with said metal portion of said

distribution means for applying a charge to said distribution means;

d. squeegee means for removing the unused toner dispersion from the copying material, said squeegee means being disposed downstream of said distribution means in the direction of image development; and



e. means, cooperating with said distribution means, for spraying off the toner adhering to said soft surface of the distribution means due to electrostatic attraction during the application of the voltage.

4,073,267

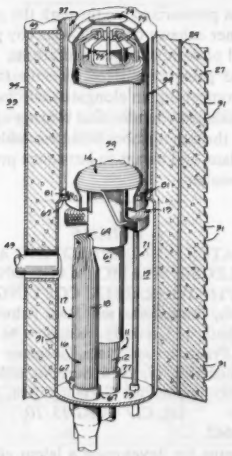
VAPOR GENERATOR

Paul S. Hunt, Poway; James P. Elliott, San Diego, both of Calif.; Johann F. Gulich, Winterthur; Max H. Weber, Wiesendangen, both of Switzerland; Jack S. Yampolsky, San Diego, and George E. Lockett, La Jolla, both of Calif., assignors to General Atomic Company, San Diego, Calif.

Continuation-in-part of Ser. No. 619,317, Oct. 3, 1975, abandoned. This application Aug. 20, 1976, Ser. No. 716,115

Int. Cl.[2] F22B *1/18*; F22G *1/00*

U.S. Cl. 122—32 **11 Claims**



1. A vapor generator comprising,

a high temperature section having a plurality of substantially straight tubes parallel with each other forming an elongated tube bundle,

a low temperature section having a plurality of substantially helical tubes forming an annular tube bundle positioned coaxially of said high temperature section, said low temperature section having an axial dimension substantially less than that of said high temperature section and being positioned toward one end thereof,

a plurality of reheater sections each having a plurality of elongated substantially straight tubes parallel with each other forming an elongated tube bundle of an axial length substantially less than that of said high temperature section, said reheater sections having their axes oriented substantially parallel with each other and with the axes of said high temperature section and being positioned toward the end of said high temperature section opposite said one end, and

means for directing a heating fluid first transversely over the tubes of said reheater sections, then along the tubes of said high temperature section toward said one end thereof, then over the helical tubes of said low temperature section in a direction parallel with the axis of said high temperature section and away from said one end thereof.

4,073,268

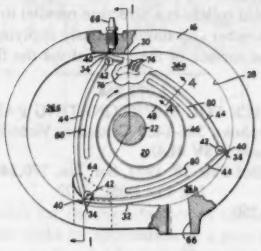
ROTARY COMBUSTION ENGINE WITH SIDE HOUSING BY-PASS PASSAGES

David M. Myers, Upper Saddle River, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Aug. 11, 1976, Ser. No. 713,386

Int. Cl.[2] F02B *53/00*

U.S. Cl. 123—8.13 **5 Claims**



1. A rotary combustion engine comprising:

a. an outer body including a pair of spaced side walls and an intermediate peripheral wall defining an internal cavity therebetween with the inner surface of said peripheral wall having a multi-lobe profile which is basically an epitrochoid and in which the lobes are joined by regions disposed relatively near to the engine axis;

b. an inner body of generally polygonal profile mounted for relative rotation within said outer body cavity, the apex portions of said inner body having sealing cooperation with said multi-lobe peripheral surface to define a plurality of working chambers between said bodies which vary in volume in response to said relative rotation;

c. seal strip means carried by the inner body on a side face of the inner body adjacent to its periphery and annular seal means co-axially carried by the inner body on said side face radially inwardly of said seal strip means with both said seal strip means and said annular seal means being disposed for sealing contact with the adjacent side wall of the outer body;

d. said last-mentioned side wall of the outer body having groove means on its inner surface disposed adjacent to and on the downstream side of a near-axis region at which combustion takes place such that the radially inner portion of said groove means terminates in a region which at all positions of the inner body relative to the outer body is disposed radially inwardly of the seal strip means and radially outwardly of the annular seal means and the radially outer portion of said groove means does not project radially outwardly beyond the seal strip means until the adjacent working chamber is in a late portion of its expansion stroke with the trailing apex portion for said working chamber being disposed in a region a short distance upstream of said near-axis region; and

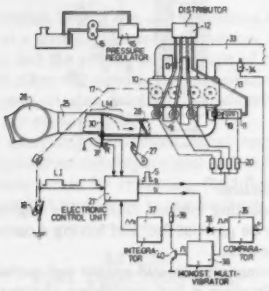
e. said last-mentioned side wall also having recess means disposed on its inner surface adjacent to and on the down-

stream side of another of said near-axis regions for transferring gases from the annular space between said seal strip means and annular seal means of the inner body to the engine working chambers during the intake stroke of said chambers.

4,073,269
FUEL INJECTION SYSTEM

Harro Herth, Schwieberdingen; Bernd Kraus, Stuttgart; Wilfried Sautter, Ditzingen and Wolf Wessel, Schwieberdingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 19, 1975, Ser. No. 605,852
Claims priority, application Germany, Sept. 9, 1974, 2442229
Int. Cl.² F02D *3/00*; F02M *7/00*
U.S. Cl. 123—32 EE **6 Claims**



1. A fuel-air control system for an internal combustion engine, including a controller with integral control characteristic for controlling the fuel-air mixture admitted to the engine (λ -control process) and including

(A) an oxygen sensor, located in the exhaust system of the engine, and capable of providing an output signal; the improvement in said fuel-air system comprising:

(B) a comparator circuit, for comparing said output signal from said oxygen sensor with a reference value and providing an output signal;

(C) an integrating circuit, whose sole control signal input is connected to the output from said comparator circuit and which delivers a changeable output signal;

(D) a flip-flop circuit, including an adjustable monostable multivibrator whose control input is connected to the output from said comparator circuit according to which output the multivibrator is set and which delivers an output signal that in addition to the output of the comparator circuit is continuously connected to the input of said integrating circuit the output signal from said flip-flop circuit inhibits the transmission of one of said output signal from said comparator to said integrating circuit for delaying the change of its output signal in one direction for a period of time corresponding to the time constant of the monostable multivibrator, thereby delaying in one direction the response of said integrating circuit to changes in the output signal from said oxygen sensor;

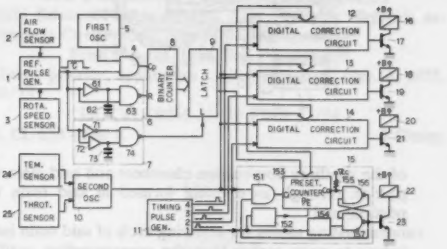
(E) a control unit, connected to the output from said integrating circuit, for providing injection valve control signals; and

(F) an air-fuel rate adjusting device connected to said control unit.

4,073,270
ELECTRONICALLY-CONTROLLED FUEL INJECTION SYSTEM

Kunio Endo, Anjo, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed June 24, 1976, Ser. No. 699,608
Claims priority, application Japan, July 2, 1975, 50-82125
Int. Cl.² F02B *3/10*; G06G *7/70*
U.S. Cl. 123—32 EB **7 Claims**



4. An electronically-controlled fuel injection system for a multi-cylinder internal combustion engine comprising:

a reference pulse generator for generating a reference pulse having a pulse width dependent upon air flow amount and rotational speed of said engine;

a counter, connected to said reference pulse generator, for converting said reference pulse width into a plural bit of code signal by counting clock pulses of constant frequency during said reference pulse width;

a memory, connected to said counter, for memorizing said code signal proportional to said reference pulse width;

oscillation means for generating oscillation signals of a frequency variable with other engine operating parameters;

a timing pulse generator for generating timing pulses, each thereof being indicative of fuel injection commencement of each engine cylinder;

a plurality of conversion means, commonly connected to said memory, said timing pulse generator and said oscillation means, for counting said oscillation signals and converting said code signal into injection pulses, each thereof being synchronized with each of said timing pulses and having a pulse width varying with said oscillation signal frequency and said code signal; and

a plurality of fuel injectors, each thereof being connected to each of said conversion means, for sequentially injecting fuel in response to said injection pulses.

4,073,271
TORCH IGNITION TYPE INTERNAL COMBUSTION ENGINE

Masafumi Yamazaki, Yokohama, and Yasuhiko Nakagawa, Kamakura, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed May 12, 1976, Ser. No. 685,451
Claims priority, application Japan, May 13, 1975, 50-57824
Int. Cl.² F02B *19/10*
U.S. Cl. 123—75 B **9 Claims**

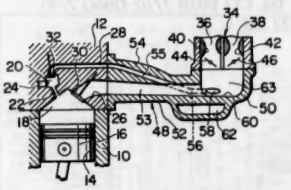
1. A torch ignition type internal combustion engine having fluidly communicated main and auxiliary combustion chambers for each of the engine cylinders, said main and auxiliary combustion chambers being respectively provided with main and auxiliary intake valves, said engine comprising:

a carburetor having a throttle valve;

a cylinder head having therein main and auxiliary intake ports which are respectively and fluidly communicable with said main and auxiliary combustion chambers through the respective main and auxiliary intake valves;

an intake manifold consisting of a main tube portion fluidly communicating with said carburetor downstream of said

throttle valve, main runner portions branched from said main tube portion and formed with main passageways communicating upstream with said main tube portion and dowstream with said main intake ports respectively, and auxiliary runner portions formed with auxiliary passageways each providing fluid communication between each



of the auxiliary combustion chambers and said main tube portion through an opening formed in said main tube portion; and

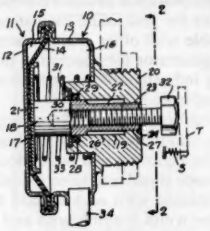
valve actuating means for allowing each of said main intake valves to open earlier than the corresponding auxiliary intake valve during the engine operation.

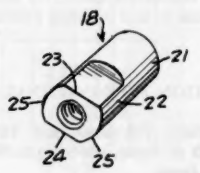
4,073,272

THROTTLE CONTROL SYSTEM

Ronald R. Burgess, Corunna, Mich., assignor to Tom McGuane Industries, Inc., Farmington Hills, Mich.

Filed Oct. 8, 1976, Ser. No. 730,805
Int. Cl.² F02D *11/08*
U.S. Cl. 123—103 B **21 Claims**





1. A vacuum controlled positioning assembly including a housing,

piston means within the housing dividing the housing into two chambers,

a plunger engaging the piston means and extending from the housing,

said housing having an opening therein,

said plunger extending through said opening, said plunger in said housing having a first cylindrical portion and a second portion including opposed parallel flat surfaces connected by arcuate cylindrical portions having the same diameter as the first cylindrical portion,

said opening having longitudinally spaced portions, one said portion being cylindrical and generally complementary to said first cylindrical portion of said plunger and the other said portion having the same configuration as said second portion of said plunger,

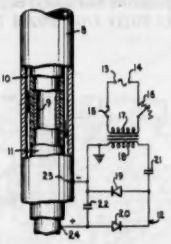
a spring yieldingly urging said piston means in a direction to retract the plunger inwardly of said housing, the outer edge of said plunger being adapted to engage a throttle member to retard the movement thereof against the action of the spring when vacuum is applied to the second chamber of the housing.

4,073,273

METHOD AND APPARATUS FOR IMPROVING ENERGY FUELS

Roy C. McMahon, 7300 Jarboe, Kansas City, Mo. 64114

Continuation of Ser. No. 536,639, Dec. 26, 1974, abandoned. This application May 11, 1977, Ser. No. 796,032
Int. Cl.² F02M *27/04*
U.S. Cl. 123—119 E **1 Claim**



1. In combination:

(a) a reciprocating internal combustion engine adapted for operation on gaseous fuel and having a carburetor associated therewith,

(b) means connected to said engine and including a power supply directing a fuel modifying electrostatic field of about 6,000 to 14,000 volts across said gaseous fuel prior to the formation of a combustible mixture in said carburetor for use in said engine,

(c) said means including an inner metallic cylinder and an outer metallic cylinder forming a passageway therebetween for said fuel and across which passageway said field is directed,

(d) said inner metallic cylinder having an insulating coating thereover to reduce the tendency for electric discharge across said passageway,

(e) said carburetor being operably located between said means and said engine whereby the fuel is treated by said means prior to carburetion.

4,073,274

AIR-FUEL METERING SYSTEM FOR INTERNAL COMBUSTION ENGINE AND APPARATUS TO CONTROL AIR FUEL RATIO OF AIR-FUEL BEING APPLIED TO ENGINE

Masaaki Saito, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Nov. 11, 1975, Ser. No. 630,802
Claims priority, application Japan, Nov. 12, 1974, 49-129582
Int. Cl.² F02M *59/10*
U.S. Cl. 123—119 R **3 Claims**

2. An air-fuel metering system for an internal combustion engine, comprising:

an induction passage with a venturi section;

a fuel reservoir;

a pump providing a source of fuel flow and pressure;

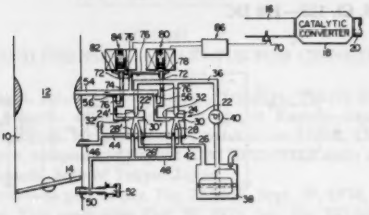
a fluidic element having a supply port in communication with the fuel from the pump, a vent port in communication with the fuel reservoir and an outlet port, the fluidic

element further having a first control port exposed to the atmospheric pressure and a second control port;

a vaccum conduit connecting the second control port with the venturi section of the induction passage, the vacuum conduit having a fixed flow restrictor therein;

air-fuel mixture circuit means connecting the outlet port of the fluidic element with the induction passage;

the fluidic element being so constructed and arranged as to increaseful flow from the supply port to the outlet port in response to an increase in the vacuum applied to the second control port;



a second conduit having one end connected to the vacuum conduit at a location thereof intermediate the fixed flow restrictor and the second control port of the fluidic element and other end opening to the ambient atmosphere;

means for generating an output signal indicative of the character of the exhaust gases;

means for generating a feedback signal responsive to the output signal from the output signal generating means; and

solenoid valve means for restricting fluid flow through the second conduit responsive to the feedback signal.

4,073,275

FUEL INJECTION PUMP

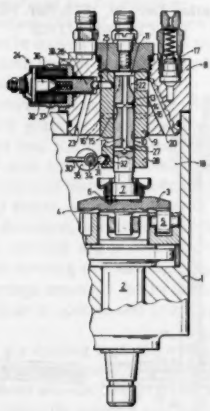
Gerald Hofer, Weissach-Flacht, and Karl Konrath, Ludwigsburg, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 27, 1976, Ser. No. 652,863

Claims priority, application Germany, Jan. 28, 1975, 2503346

Int. Cl.² F02M *59/24*

U.S. Cl. 123—139 AF **8 Claims**



1. In a fuel injection pump including a housing, a fuel storage compartment in said housing, a bushing defining a cylinder, a piston with control grooves moving within said cylinder, shaft means for rotating and reciprocating said piston, said piston and said housing defining a pressure chamber, a channel disposed between said fuel storage compartment and said pressure chamber, and control means for controlling the fuel flow in said channel, the improvement comprising

at least one of said control grooves in said piston obturates the terminus of said channel in said cylinder and said control means permits adjustment of the timing of the fuel flow through said channel after said piston has executed a partial compression stroke.

4,073,276

FUEL INJECTION PUMPING APPARATUS

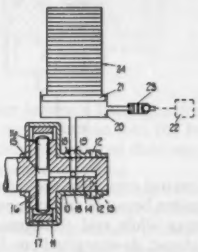
Wilfrid Edward Walter Nicolls, East Molesey, England, assignor to Cav Limited, Birmingham, England

Filed Feb. 23, 1976, Ser. No. 660,665

Claims priority, application United Kingdom, Mar. 4, 1975, 8859/75

Int. Cl.² F02M *51/04*; F04B *35/04*

U.S. Cl. 123—139 E **5 Claims**



1. A fuel injection pumping apparatus for an engine comprising a housing having a plurality of outlet ports, a rotary distributor member located within said housing and operatively connected with said engine so as to be driven in timed relationship with said engine, a delivery passage formed in the distributor member and arranged to register in turn with said outlet ports in said housing, an injection pump which supplies a charge of fuel through said delivery passage each time the delivery passage registers with an outlet port, means for supplying fuel to said injection pump comprising a cylinder, a pumping piston contained within said cylinder, a piezo-electrical crystal unit for actuating said piston, first valve means operable to place said cylinder in communication with said injection pump, and second valve means through which said fuel can be supplied to said cylinder, and a drive circuit for said crystal unit and a transducer for providing first and second signals to the drive circuit to energize and de-energize the crystal unit, a part rotatable with the distributor member, said transducer being positioned adjacent said part, the arrangement being such that when said first valve means is opened, said crystal unit is energized to cause movement of the piston in the direction to displace fuel to the injection pump, the crystal unit being de-energized when said first valve means is closed to move the piston in the opposite direction, thereby to draw a fresh quantity of fuel into said cylinder by way of said second valve means.

4,073,277

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Franz Eheim, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 27, 1976, Ser. No. 652,872

Claims priority, application Germany, Jan. 28, 1975, 2503324

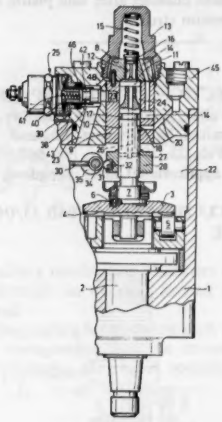
Int. Cl.² F02M *59/42*

U.S. Cl. 123—139 BD **9 Claims**

1. In a fuel injection pump including a housing, a fuel storage compartment, a cylinder in said housing, a piston moving reciprocatingly in said cylinder and defining a pressure cham-

ber, at least one supply conduit between said compartment and said pressure chamber,

a normally closed electromagnetic valve mounted in said housing for controlling the flow of fuel through said conduit, the improvement wherein:



further fuel control means are provided for controlling fluid communication between said compartment and said pressure chamber while said electromagnetic valve is in its normally closed, de-energized condition.

4,073,278

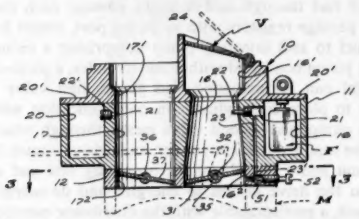
CARBURATOR

Edward R. Glenn, 2300 Laurel, Newport Beach, Calif. 92660

Filed Jan. 16, 1976, Ser. No. 649,869

Int. Cl.² F02D *13/06*

U.S. Cl. 123—198 F **6 Claims**



1. In combination a multi-cylinder internal combusion engine with an intake manifold with two related sets of tunnels, each set of tunnels communicating with one half of the cylinders and each having a common upwardly opening inlet end, said carburator releasably secured to the manifold and having two elongate vertically extending venturi throats, each having a lower end communicating with the inlet end of one set of tunnels in the manifold, an air conducting throat communicating with one of said sets of tunnels, throttle valve members in the lower portions of the venturi throats and a shut-off valve member in the air conducting throat, fuel dispensing idle jets in the venturi throats below the throttle valve members and fuel dispensing high speed jets in the venturi throats above the throttle valve members, fuel delivery means to deliver fuel to the jets, manually operable selector means to selectively move the shut-off valve member between open and closed positions and to hold the one throttle valve member in the venturi throat communicating with said one set of tunnels in a closed position when the shut-off valve member is in an open position and manually operable throttle valve operating means to synchronously shift the throttle valve members between open and closed positions when said one throttle valve member is not held closed and to shift the other throttle valve member between open and closed positions when said one throttle valve member is held closed.

4,073,279

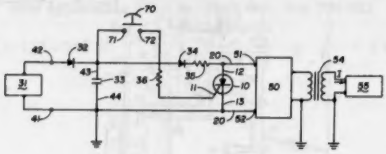
INTERNAL COMBUSTION ENGINE SHUT-OFF DEVICE

Wayne S. Fox, Jordan, Minn., assignor to Kawasaki Motors Corporation, U.S.A., Santa Ana, Calif.

Filed May 6, 1976, Ser. No. 683,794

Int. Cl.² F02B *77/00*

U.S. Cl. 123—198 DC **15 Claims**



1. A shut-off device for an internal combustion engine having an electric ignition, said device comprising:

switching means having a first state and a second state;

means connecting said switching means to the ignition of the engine so that the ignition current is not inhibited when the switching means is in its first state and is inhibited when the switching means is in its second state;

means operatively connected to the switching means for causing a transition from the first state to the second state; and

means operatively connected to the switching means, for automatically maintaining the switching means in its second state for a predetermined interval of time sufficient to allow the engine to cease operation.

4,073,280

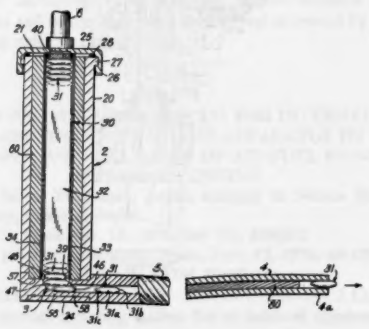
RAPID FIRE GUN

Wilbur R. Koehn, 160 Main St., Port Washington, N.Y. 11050, and John H. Detwiler, 71 Ridge Crescent, Manhasset, N.Y. 11030

Division of Ser. No. 730,736, May 21, 1968, Pat. No. 3,996,916. This application Dec. 29, 1975, Ser. No. 644,518

Int. Cl.² F41B *11/02*

U.S. Cl. 124—72 **5 Claims**



1. A gun capable of firing elongated projectiles at a rapid rate, comprising a barrel having a bore of a given diameter with openings at the front and rear thereof, said gun having a loading chamber of substantially the given diameter of said bore and having a forward opening connected to the rear opening of said bore, a side breech opening which opens into

the side of said chamber and being effectively the only opening into said chamber apart from said forward opening, said side breech opening having a forward to rearward dimension at least twice as great as said given diameter, said gun having a passageway connected to said side breech opening of at least said forward to rearward dimension, a gas-source opening into said passageway spaced a substantial enough distance from said side breech opening to be clearly separate from said side breech opening, supply means for supplying motive gas under pressure connected to said gas-source opening for directing gas under high pressure through said passageway, in said side breech opening, through said chamber, and out said bore.

4,073,281

TRUING AND DRESSING APPARATUS FOR GRINDING WHEELS

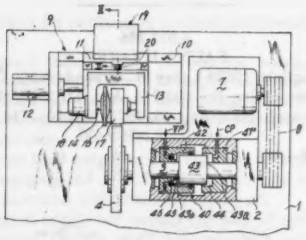
Toshio Asaeda, No. 1-9-19, Kaminoge, Setagaya, Tokyo; Ikuo Suzuki, Chiryu, Japan; Tomoyasu Imai, Kariya, Japan; Masato Kitajima, Hekinan, Japan, and Kazunori Hota, Okazaki, Japan, assignors to Toyoda-Koki Kabushiki-Kaisha and Toshio Asaeda, both of Tokyo, Japan

Continuation-in-part of Ser. No. 727,678, Sept. 29, 1976, abandoned. This application Oct. 29, 1976, Ser. No. 737,043

Claims priority, application Japan, Sept. 29, 1975, 50-117402; Sept. 29, 1975, 50-117403; Oct. 14, 1975, 50-124084

Int. Cl.[2] B24B *53/04*

U.S. Cl. 125—11 CD **17 Claims**



1. An apparatus for truing and dressing a grinding wheel made of cubic boron nitride and rotatably mounted on a grinding machine, comprising in combination:

roll carriage means slidably mounted on said grinding machine so as to be moved in a first direction heading for said grinding wheel and in a second direction transversely relative to said first direction;

a truing roll provided at an outer peripheral surface thereof with abrasive grain as hard as diamond and rotatably supported on said roll carriage means with its rotational axis parallel with said second direction;

a dressing roll made of metal and rotatably supported on said roll carriage means with its rotational axis parallel with said second direction, said truing and dressing rolls being arranged to establish a gap of a predetermined distance between said dressing roll and said grinding wheel when said roll carriage means is fed to such a position in said first direction as to contact said truing roll with the grinding wheel;

in-feed means for feeding said roll carriage means toward said grinding wheel so as to give an in-feed movement of a predetermined amount to said truing and dressing rolls;

traverse feed means for moving said roll carriage means in said second direction so as to contact said truing roll with said grinding wheel over the entire width of the same in a truing operation and so as to face said dressing roll with said grinding wheel after said truing operation and prior to a dressing operation; and

means for supplying liberation abrasive grain toward said gap between said dressing roll and said grinding wheel during said dressing operation, the mean size of said liberation abrasive grain being larger than said gap.

4,073,282

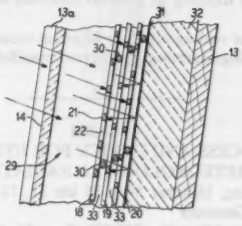
SOLAR PANEL

Arno H. Schriefer, Jr., R.R. 1, Dewey, Ill. 61840

Filed Sept. 16, 1976, Ser. No. 723,987

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—270 **7 Claims**



1. In a solar collector having a housing, a front transparent panel to allow solar energy to pass into the housing, a back panel, and means for delivering forced fluid into and out of the housing, the improvement comprising

a matrix of multiple layers of a black coated sheet, each layer having a plurality of open meshes defined by a closed loop, each loop having a raised side portion and a lowered side portion, and all said raised portions being regularly repeated along a unidirectional line, said unidirectional line in one sheet positioned at 90° relative to a unidirectional line in an adjoining sheet of the matrix, and

a reflective surface within the housing at said back panel, said reflective surface spaced from said matrix.

4,073,283

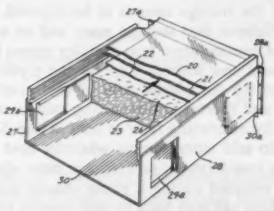
MODULAR CONSTRUCTION FOR SOLAR HEAT COLLECTOR

George O. G. Löf, Englewood, Colo., assignor to Solaron Corporation, Denver, Colo.

Filed Feb. 27, 1975, Ser. No. 553,471

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—270 **13 Claims**



1. Modular construction for solar heat collectors using air transfer medium and arranged for connection to similar units comprising:

a. a generally rectangular modular housing member including thin side walls and a bottom arranged to be connected with removable end walls or end to end with adjacent similar members and having an open top including means for securing cover means thereon, said housing member being arranged with a cool air integral, internal manifold section across one end within said side walls and a heated air integral, internal manifold section across the opposite end and within said side walls and a heat absorber internal section between the two with an air passage permitting exchange of heat to air passing through said heat absorber internal section, each said internal manifold having a

cross-sectional dimension greater than said air passage through said heat absorber passage whereby the flow of air through said manifold is at a rate of flow less than the rate through absorber;

b. means for forming an opening in at least one side wall in said cool air manifold section arranged to mate with a similar opening in an adjacent member, and means for forming an opening in at least one side wall in said heated air manifold section arranged to mate with a similar opening in an adjacent member;

c. means for sealing together adjacent units at mated cool air openings forming an internal manifold for both members; and

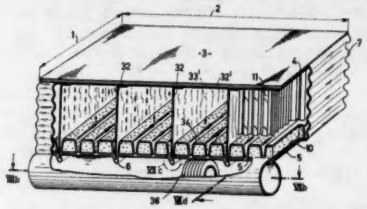
d. means for sealing together adjacent units, at mated heated air openings forming an internal manifold for both members.

4,073,284

PROCESS AND DEVICE FOR UTILIZING METEOROLOGICAL RADIATIONS

Nikolaus Laing, Hofener Weg 35 bis 37, 7141 Aldingen near Stuttgart, Germany

Continuation of Ser. No. 370,830, June 18, 1973, abandoned.
This application June 25, 1975, Ser. No. 590,062
Claims priority, application Austria, June 23, 1972, 5406/72
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **2 Claims**



1. A device for receiving and storing solar energy comprising a coating having a planar area adapted to strongly absorb solar energy where the coating possesses low emissivity in the infra-red region, a crystalline storage mass having a planar area substantially equal to the planar area of said coating and wherein said storage mass has a phase change point at a predetermined temperature equal to the desired working temperature to which the storage mass is to be exposed, said coating being situated above said storage mass, and an automatic vaporization and condensation heat rectifier means between said coating and said heat storage mass having a planar area substantially equal to the planar area of said coating and said storage mass and thermally connecting said coating and said storage mass for restricting flow of heat in one direction from said coating to said storage mass whereby heat absorbed by said coating is transferred to said storage mass where it may be subsequently released during a phase change and whereby a minimum of heat radiated back to said coating from said storage mass is emitted to free space.

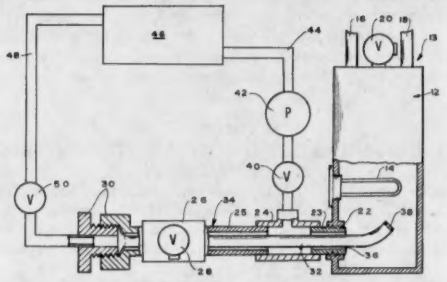
4,073,285

FLUID HANDLING SYSTEM

I. L. Wendel, St. Petersburg, Fla., assignor to James L. Lowe, St. Petersburg, Fla.

Filed Feb. 9, 1976, Ser. No. 656,641
Int. Cl.[2] F24J *3/02*; F22B *5/02*
U.S. Cl. 126—271 **8 Claims**

1. A fluid handling installation comprising, a container for fluid, said container having an upper portion for normally containing relatively hot fluid and having a lower portion for normally containing relatively cold fluid, and said container having a connection opening therethrough, an integral fitting for connection with the container, said fitting having a pair of nested tubes transversely spaced apart for receipt of fluid therebetween, an outer one of said tubes being connected with said connection, and said tubes having first open portions opening within the same said portion of said container and said tubes further having second open portions sealed from each other and connected in circuit with a source of relatively hot fluid for delivery to said container and for receiving the relatively cold fluid from said container, the first open portion of said inner tube being spaced longitudinally outwardly from and opening in a direction away from the first open portion of said outer tube to retard direct intermixing of fluid passing through said first open portions, and the second open portion of said outer tube being between the open portions of said inner tube.

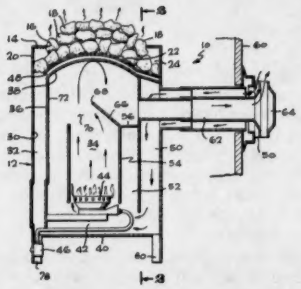


4,073,286

SAUNA HEATER

Tauno F. Kartiala, 15836 Lahey St., Granada Hills, Calif. 91344

Continuation of Ser. No. 603,713, Aug. 11, 1975, abandoned.
This application Aug. 16, 1976, Ser. No. 714,578
Int. Cl.[2] F24H *1/00*
U.S. Cl. 126—344 **16 Claims**



1. A sauna heater, comprising:

an upright housing having wall structure defining an inner combustion chamber within said housing, said chamber including a top, a bottom and opposite side walls;

a heating element at the bottom for producing combustion gases in said chamber in response to air conducted to said heating element;

air supply means including an air opening through one of said side walls at a position spaced downwardly from said top;

flue means including a flue opening concentrically with said air opening through said one of said side walls at said position spaced downwardly from said top;

rock supporting means carried by said housing at a position spaced upwardly from said top, said supporting means being adapted for indirect heat-interchange between said chamber top and rocks piled on said supporting means to provide steam;

a gas flow conducting element disposed in the path of the

ascending gas flow in said chamber on an angle inclined upwardly from said one side wall and having a free edge defining a passageway for gases between said element and an opposite one of said side walls so that the major draft of said heating is directed past said edge and onto said top and thence toward said flue opening; and

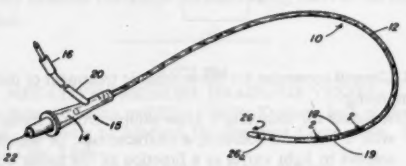
drainage means extending axially downwardly from said rock supporting means, laterally and freely spaced from said combustion chamber to a point below said housing to discharge unabsorbed excess water.

4,073,287

URETHRAL PROFILOMETRY CATHETER

William E. Bradley, and Geoffrey Steven Gates, both of Minneapolis, Minn., assignors to American Medical Systems, Inc., St. Louis Park, Minn.

Filed Apr. 5, 1976, Ser. No. 674,061
Int. Cl.[2] A61B *5/10*
U.S. Cl. 128—2 R **8 Claims**



1. A catheter for performing urethral profilometry comprising:

an elongated tubular body portion for insertion into the urethra, said body portion having an urethra engaging end and a fluid input end and comprising a first flexible tube and a second flexible tube coaxially disposed internally of said first tube;

at least one fluid output orifice disposed adjacent said urethra engaging end of said body portion and in fluid flow communication with said fluid input end;

an elongated conductor passage defined between said first and second flexible tubes and extending parallel to the longitudinal axis of said tubes;

conductor means disposed in said elongated conductor passage for delivering electrical signals externally of said catheter;

at least one electrode hole extending through said first flexible tube of said body portion; and

electrode means attached to said body portion for sensing electrical signals, said electrode means comprising an outer circular band portion overlying said first flexible tube for sensing electrical activity, an inner circular band portion disposed below said electrode hole between said first and second flexible tubes in electrical contact with said conductor means, and an integral portion thereof extending through said electrode hole between said inner and outer band portions.

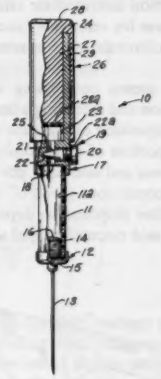
4,073,288

BLOOD SAMPLING SYRINGE

Samuel L. Chapman, 2814 Conner St., Port Huron, Mich. 48060

Filed June 21, 1976, Ser. No. 698,270
Int. Cl.[2] A61B *5/14*
U.S. Cl. 128—2 F **3 Claims**

1. A blood sampling syringe, comprising a hollow cylinder which is closed off by hollow needle means at one end, for receiving a specimen, an expandable encasement means sealingly positioned around the opening of said needle into said cylinder, said encasement means serving to receive said specimen, a cylindrical control valve body threadingly received on the opposite end of said cylinder, by the end wall means of said control valve body, a passage extending through said control valve body, a screw valve means operating transversely of said passage in said control valve body for opening and closing said passage, a bore in said control valve body and communicating with said passage at an end opposite from said hollow cylinder such that said screw valve means is located between said hollow cylinder and said bore, a solid and cylindrical shank means



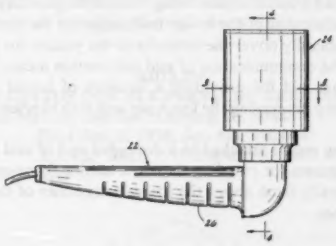
sealingly and slidably positioned in said bore to provide means for creating a vacuum in said bore when said screw valve means is positioned to close said passage and to subsequently draw a specimen through said needle when said screw valve means is positioned to open said passage.

4,073,289

METHOD OF MALE CONTRACEPTION FOR DOMESTIC MAMMALS HAVING A SCROTUM

Mostafa S. Fahim, 500 Halen Drive, Columbia, Mo. 65201

Filed Apr. 30, 1976, Ser. No. 682,062
Int. Cl.[2] A61H *19/00*; A61F *7/00*
U.S. Cl. 128—24 A **11 Claims**



1. A method of suppressing spermatogenesis in domestic animals, excluding humans, having scrotal testes which comprises applying continuous ultrasonic vibrations selectively only to the testes of said animal at an effective power level and at a frequency sufficient to penetrate said scrotal testes and for a sufficient time to temporarily or permanently suppress spermatogenesis while causing the subject substantially no discomfort.

4,073,290

PELVIC TRACTION BELT

Edward L. Farrar, Jr., 117 E. Copeland, Orlando, Fla. 32806

Filed May 19, 1976, Ser. No. 687,642
Int. Cl.[2] A61H *1/02*
U.S. Cl. 128—75 **7 Claims**

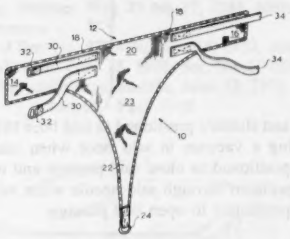
1. A pelvic traction belt for transmitting a longitudinal traction force and a rotary traction force through the pelvic area to

the spinal column of a human wearer located generally in the supine position, said pelvic traction belt comprising:

a circumferential section for encircling the pelvic area of the wearer, said circumferential section having opposing end portions constituting a front of said circumferential section when being worn, said circumferential section having a back portion intermediate said end portion;

fastening means for removably securing said end portions of said circumferential section around the pelvic area of the wearer;

tail traction means comprising a substantially triangular configuration and including a base, said tail traction means through disposition of said base being integrally formed to said back portion of said circumferential section, said tail section means and said back portion formed from a single, generally continuous piece of material, said tail traction means further disposed to depend generally perpendicularly from said circumferential section for communicating



generally upwardly between the legs of the wearer for transmitting said longitudinal traction force and said rotary traction force through the pelvic area to the spinal column, said longitudinal traction force being generally parallel to the spinal column of the wearer and said rotational traction force for effecting a rotation of the lower spinal column about an axis generally parallel to an axis communicating between the pelvic crests of the wearer, said tail traction means being formed to generally cover a broad section of the lower back adjacent the sacrum and to generally cover the buttocks of the wearer for cushioning the communication of said tail traction means with the sacrum and for providing a measure of lateral stability, thereby decreasing the force per unit area exerted thereon; and

coupling means attached to a distended end of said tail traction means for coupling thereto a tension force emanating generally from above the lower extremities of the supine wearer.

4,073,291

TOPICAL DEVICE FOR ADMINISTERING TRETINOIN

John R. Marvel, and James A. Mezick, both of East Brunswick, N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed July 28, 1976, Ser. No. 709,370
Int. Cl.[2] A61F *13/02*
U.S. Cl. 128—155 **10 Claims**

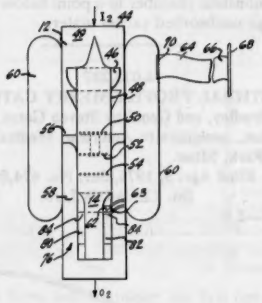
1. A therapeutic device comprising a flexible backing having coated thereon a dermatologically acceptable pressure-sensitive adhesive which is compatible with, and has uniformly distributed therein, a therapeutically effective amount of tretinoin.

4,073,292

CONTROL APPARATUS FOR THE AUTOMATIC TREATMENT OF DIABETES

William Edelman, 43 Livingston Lane, Englishtown, N.J. 07726

Filed Oct. 29, 1976, Ser. No. 736,996
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—214 E **8 Claims**



1. Control apparatus for the automatic treatment of diabetes, comprising:

first means for admixing a urine sample from a living body with a chemical solution, a characteristic of which with respect to light varies as a function of the molar concentration of glucose complexes present in said sample;

second means providing said chemical solution;

third means providing a source of light;

fourth means exposed to said source of light via the admixture of said first means and responsive to the light impinging thereon for generating a control signal representative of the molar concentration of said glucose complexes present;

fifth means providing a source of modified insulin of increased pH; and

sixth means responsive to said control signal for automatically injecting a predetermined amount of said modified insulin into an artery of the body to maintain the level of glucose complexes within the blood within prescribed limits;

with said first, second, third, fourth, fifth and sixth means, being adapted to be surgically implanted within the body and with said second and fifth means being replenishable with chemical solution and insulin, respectively, without the need for additional surgical procedures.

4,073,293

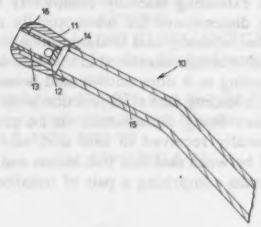
NOZZLE TIP

Ian Ross Phillips, Pymble, and Mervyn Frank Reynolds, Dee Why, both of Australia, assignors to N. J. Phillips Pty. Limited, Dee Why, Australia

Filed Sept. 21, 1976, Ser. No. 725,051
Claims priority, application Australia, Nov. 27, 1975, 4086/75
Int. Cl.[2] A61D *7/00*
U.S. Cl. 128—223 **4 Claims**

1. A drench gun nozzle tip insert to control leakage of drench via the nozzle by providing a region of high surface tension in the drench; said tip comprising a body dimensioned to be sealingly fitted within the nozzle tip so that drench ejected from the gun must pass through the insert, said body having a liquid inlet to be located within the nozzle and a liquid outlet to be located adjacent the free end of the nozzle, duct means providing liquid communication between said liquid inlet and said liquid outlet, said duct means including a main passage extending from said liquid outlet and terminating within said body, said liquid inlet including a series of smaller passages providing communication between the upstream portion of said nozzle with said main passage to thereby form

a region of high surface tension in a free surface of said drench adjacent said smaller passages, said body being generally of tubular shape with a flange at one end and with said smaller passages extending radially inwardly from the peripheral surface of the body adjacent the other end to said one end, and said main passage extending longitudinally from the end face of the body adjacent the flange but terminating short of the other end face.

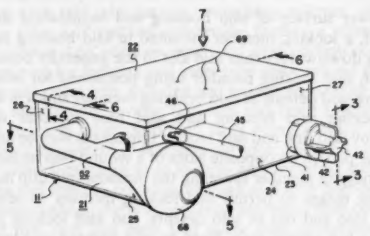


4,073,294

NEGATIVE PRESSURE DRAINAGE VESSEL

James Robert Stanley, and Silas Charles Topham, both of Orem, Utah, assignors to Medical Development Corporation, Salt Lake City, Utah

Filed July 23, 1975, Ser. No. 598,369
Int. Cl.[2] A61M *1/00*
U.S. Cl. 128—278 **7 Claims**



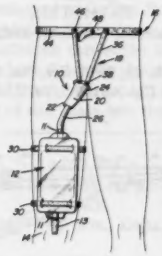
7. An aspiration vessel adapted to be carried on the body of a patient and to be connected to a wound or the like requiring suction drainage of fluids, said vessel comprising wall means defining a substantially rigid container, a resilient, elastomeric diaphragm in the interior of said container sealingly attached to the walls thereof to provide a chamber from which air can be evacuated, said chamber being defined by said diaphragm and a portion of said walls of said container, an aperture being provided in the portion of the wall means of said container which do not define said chamber, a fluid inlet in the portion of the wall means which define said chamber, said fluid inlet being connected through conduit means to the wound to be drained, an air outlet in the portion of the wall means which define said chamber, manually operable pump-down means including a one-way air inlet valve connected to said air outlet and a one-way air outlet valve communicating with the atmosphere whereby the action of the said pump-down means withdraws air from said chamber to allow atmospheric pressure to extend said diaphragm, the resiliency of the diaphragm providing a continuing negative pressure in said chamber to withdraw fluid from the patient, and as negative pressure is dissipated during drainage of said wound, said manually operable pump-down means may be reactivated to reestablish the directed negative pressure without danger of providing a positive pressure in said chamber which could force fluid material back into the wound being drained.

4,073,295

CATHETER

Jennie Laufbahn, Bronx, N.Y., assignor to Henry A. Schon, Brooklyn, N.Y., a part interest

Filed May 12, 1976, Ser. No. 685,884
Int. Cl.[2] A61F *5/44*
U.S. Cl. 128—295 **1 Claim**



1. A catheter comprising a flexible, resilient and thin tubular member defining a sheath-like bag positioned in enclosing relation to a substantial portion of a male wearer's penis, said bag including a closed end portion having a drain tube communicated therewith and extending to a leg attached urine collecting bag, the open end of said sheath-like bag being defined by a thickened end portion, said thickened end portion including attaching means thereon to which a pair of upwardly extending flexible, resilient support straps are attached, a flexible resilient waist belt encircling the waist of the wearer and having the upper ends of the support straps attached thereto thereby supporting the sheath-like bag in place; said attaching means are in the form of two slots disposed outwardly of the body surface of the wearer; said straps being connected to the attaching means by being looped through the slots with the free end of the strap being reversely folded and secured to the main portion of the straps by double headed buttons; and wherein the straps and the waistband are provided with a plurality of small longitudinally spaced openings whereby the straps and the waistband are adjustably connected by double-headed buttons extending through selected openings.

4,073,296

APPARATUS FOR ACUPRESSURE TREATMENT

Francis J. McCall, Box 236, Lansing, Ill. 60438

Filed Jan. 2, 1976, Ser. No. 646,003
Int. Cl.[2] A61B *17/00*; A61H *39/04*
U.S. Cl. 128—303 R **3 Claims**

1. An acupressure treatment device comprising:
a plastic mold conforming to a human external ear,
said mold adapted to be removably retained in said ear in a predetermined position, relative to acupuncture points located in the ear and influencing corresponding specific body functions to be treated; and
nodule means embedded in said plastic mold,

said nodule means not less than about one millimeter in diameter,

said nodule means positioned on said mold to depress at least one of said specific acupuncture points and thereby treat said corresponding body function, when said mold is retained in said predetermined position in said ear.

4,073,297

CATHETER

Klaus F. Kopp, Kirchseeon, Germany, assignor to Sandoz Ltd., Basel, Switzerland

Filed Feb. 11, 1976, Ser. No. 657,093
Int. Cl.[2] A61M *5/14, 25/00*
U.S. Cl. 128—214.4 **7 Claims**

1. A catheter for placement in an artery, vein or fistula vessel of a patient, through which blood may be withdrawn or delivered to the patient, which comprises a catheter defining an outer lumen having a cross-sectional area in a proximal end region of the catheter which is larger than the cross-sectional area of the outer lumen in a distal end region of the catheter, at least one opening being provided in the wall of the catheter in the distal end region thereof, a hub having a bore, connected coaxially to the proximal end of the catheter, a hollow cylindrical body coaxially connected to the hub and having connection means at its free end, for connection to a blood line, a hollow cylindrical side arm leading into the side of the hollow cylindrical body and having means for connection to a blood line, a hollow needle defining an inner lumen through which blood may be delivered to the patient which passes coaxially through the hollow cylindrical body, through the hub and through the catheter so that the point of the needle protrudes beyond the distal end of the catheter, the cross-sectional area of the outer lumen diminishing to a minimum cross-sectional area at the distal end of the catheter from a position distal to the distally most extreme opening in the wall of the catheter, said minimum cross-sectional area of the outer lumen corresponding to the outer cross-sectional area of the needle so that the distal end of the catheter seals against the wall of the needle, an annular outer lumen in communication with the hollow cylindrical body and the hollow cylindrical side arm thereby being defined by the inner surface of the catheter and by the outer surface of the needle, which annular outer lumen progressively increases in cross-sectional area rearwardly towards the proximal end of the catheter from the distal end region, the cross-sectional area of the bore of the hub being at least as large as the sum of the outer cross-sectional area of the needle and the largest cross-sectional area of said annular outer lumen.

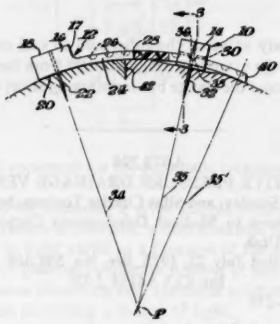
4,073,298

WOUND CLIP

Pierre L. Le Roy, Wilmington, Del., assignor to New Research & Development Lab., Inc., Wilmington, Del.

Filed Aug. 3, 1976, Ser. No. 711,250
Int. Cl.[2] A61B *17/08*
U.S. Cl. 128—337 **12 Claims**

1. A wound clip for use on wound flaps in surgical use comprising an elongated base member, said base member having a head portion at one end of said base member, said head portion having an upper surface and a lower surface, first tine means mounted in said head portion extending outwardly from said lower surface, said first tine means terminating in points disposed remote from said lower surface, said base member having a thin flat bridging member permanently secured to said head portion laterally thereof, said head portion being substantially thicker than said bridging member, said bridging member having an upper surface and a lower surface, a plurality of longitudinally aligned detents in said upper surface of said bridging member, a housing, said housing being substantially thicker than said bridging member, said housing having a horizontal slot extending laterally completely therethrough, said slot being dimensioned for telescopically receiving said bridging member whereby said bridging member may slide in said housing while being maintained in the same lateral orientation in said housing as it does outside said housing, said head portion having a leading face at its junction with said bridging, said leading face being dimensioned to be prevented from being telescopically received in said slot, said leading face being disposed between said first tine means and said housing, second tine means comprising a pair of tines extending from



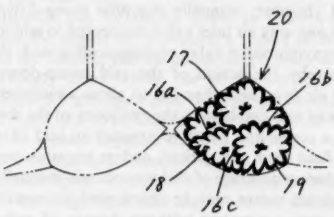
the lower surface of said housing and terminating in points thereof, a locking member mounted in said housing and projecting downwardly into said slot in the generally central area thereof, said locking member being positioned for selectively entering said detents as said bridging member slides in said slot for locking said housing and said base member together whereby said first and said second tine means may be anchored into the patient on opposite sides of a wound flap incision with said bridging member spanning the incision, said clip including resilient means to permit said locking member to selectively move into and out of said detents, and said locking member being a lug permanently fixed to said housing and located in said housing in the general area of said second tine means in line with and between said tines to confine the locking action in the vicinity of said thickened housing where said housing is anchored.

4,073,299

THREE-DIMENSIONAL EMBROIDERED ARTICLE AND THE METHOD FOR THE PRODUCTION OF THE SAME

Shuhei Murata, 29-4, Higashimachi, Tojiin, Kita, Kyoto, Japan

Filed May 25, 1977, Ser. No. 800,201
Claims priority, application Japan, Nov. 11, 1976, 51-136598
Int. Cl.[2] A41C *3/00*
U.S. Cl. 128—425 **3 Claims**



3. A three-dimensional embroidered article comprising a

plurality of cloth pieces joined together by seaming to form in a three-dimensional shape, each of said cloth pieces having an elemental embroidery pattern including at least embroidery pattern lines extending substantially along lines of said seaming.

4,073,300

METHOD OF MAKING RUSSIAN CIGARETTES

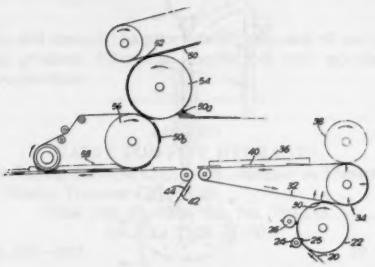
Desmond Walter Molins, London, England, assignor to Molins Limited, London, England

Filed Nov. 10, 1975, Ser. No. 630,518

Claims priority, application United Kingdom, Nov. 15, 1974, 49663/74; Feb. 5, 1975, 4853/75

Int. Cl.² A24C 5/52

U.S. Cl. 131—61 A 8 Claims



1. A method of making Russian cigarettes, each cigarette comprising axially adjacent tobacco and double-walled tube portions, each said tube portion comprising an inner tube and an outer tube; said method comprising feeding a plurality of reverse folded strip portions, each said strip portion comprising a first part for forming said inner tube and a second part for forming said outer tube, said first and second parts being joined along a longitudinal reverse fold line and lying substantially parallel to each other, said fold lines being parallel to the direction of movement of said strip portions; feeding a plurality of said tobacco portions so as to form an alternating stream of said strip and tobacco portions; forming said strip portions into said double-walled tube portions, each said inner tube comprising said first part and each said outer tube comprising said second part, and wrapping said alternating stream to produce a rod; and dividing said rod into individual Russian cigarettes.

4,073,301

LIQUID TREATMENT OF SMALL ARTICLES

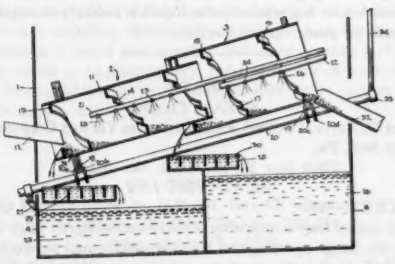
Robert Ian Mackinnon, Tupsley, England, assignor to Huntington Alloys, Inc., Huntington, W. Va.

Filed Sept. 15, 1976, Ser. No. 723,522

Claims priority, application United Kingdom, Sept. 26, 1975, 39560/75

Int. Cl.² B08B 3/02

U.S. Cl. 134—65 7 Claims



1. Apparatus for treating small articles with liquid comprising an imperforate drum mounted to rotate around an axis inclined to the horizontal, a scroll attached to the interior of the drum and having at least one interruption across the length of the scroll and extending the full depth of the scroll and dividing the scroll into portions, the outer edge of each portion being continuously attached to the interior of the drum and the inner edge being unobstructed to flow of fluid over the edge at places where fluid collects to a depth greater than the depth of the scroll and the leading and trailing ends of each portion of the scroll being overlapped and offset from each other at the place of the interruption sufficiently to provide that articles being treated are deflected across the interruption and prevented from moving back down the drum, means for introducing a liquid into the drum and means for recirculating the treatment liquid out of and again into the drum.

4,073,302

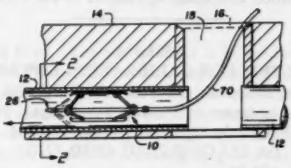
CLEANING APPARATUS FOR SEWER PIPES AND THE LIKE

Thomas E. Jones, 11689-74th Ave., Delta, B. C., Canada (V4C 1E6)

Filed Jan. 18, 1977, Ser. No. 760,345

Int. Cl.² B08B 9/04

U.S. Cl. 134—167 C 1 Claim



1. Apparatus for cleaning the interior of a pipe comprising a tubular body having a smooth cylindrical bore and rear and front ends, coupling means on the rear end for connecting the tubular body to a conduit leading to a source of cleaning fluid under high pressure, a nozzle on the front end; said nozzle having a first cylindrical chamber of substantially the same diameter as the bore and a second cylindrical chamber of lesser diameter, a front end wall substantially closing one end of the second cylindrical chamber, and a plurality of jets communicating with the first chamber and arranged to discharge outwardly and rearwardly directed jet streams of the cleaning fluid to scour the interior of the pipe and create a forward-propelling reaction force; a carriage assembly including a pair of hubs mounted on the body, at least three legs pivotally secured at inner ends thereof to each hub, said legs being arranged on the pair of hubs as converging pairs of legs, a wheel rotatably mounted on an outer end of each leg for primary engagement with the interior of the pipe, a skid pivotally connected to outer ends of each converging pair of legs, said skids extending parallel to the longitudinal axis of the tubular body and intended for secondary engagement with the interior of the pipe, and means for adjusting at least one of the pair of hubs longitudinally of the tubular body whereby to position the skids a selected distance from said body and locate the nozzle centrally of the pipe.

4,073,303

OIL FIELD PIG LAUNCHER AND RECEIVER

Lawrence E. Foley, Jr., P.O. Box 935, Jennings, La. 70546

Filed Sept. 28, 1976, Ser. No. 727,604

Int. Cl.² B08B 9/04

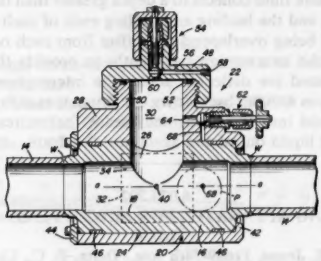
U.S. Cl. 137—15 12 Claims

1. A pig valve for use with a pigging system of a pipeline, comprising, in combination:

(a) a body providing a straight through passage and insertable into a pipeline, with the passage forming part of a fluid flow path through the pipeline;

(b) a sleeve rotatably disposed surrounding the body; and

(c) access means associated with the sleeve and body for permitting a pig to be transferred between the passage provided in the body and a point outside of the pipeline, the access means including an opening provided in the



body, with the sleeve having an enlarged portion and the access means further including a chamber formed in the enlarged portion of the sleeve and disposed for communicating with the opening provided in the body in a one axial position of the sleeve relative to the body.

4,073,304

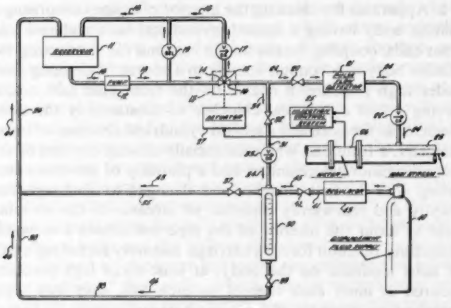
SYSTEM FOR CALIBRATING A PUMP

Julius Lerner, Broomall, and Edmundo J. Iglesias, Lindwood, both of Pa., assignors to Suntech, Inc., Wayne, Pa.

Filed July 12, 1976, Ser. No. 704,204

Int. Cl.[2] G01F *25/00*; G05D *11/02*

U.S. Cl. 137—101.21 **4 Claims**



1. A closed system for calibrating the pumping rate of a pump so that the fluid being pumped into the calibration system is returned to the fluid supply reservoir to be pumped again, said calibrating system comprising:

(a) means for collecting the fluid being pumped by the pump, said collecting means having a scale for indicating the fluid level in the collecting means, and a first coupling at its upper level and a second coupling at its lower level;

(b) means for providing fluid communication between the first coupling and the reservoir to provide a vapor return line for the collecting means, thereby providing a path for the vapors in the collecting means to be displaced through when the pumped fluid is pumped into the collecting means;

(c) means for providing fluid communication between the second coupling and the reservoir to provide a liquid return line;

(d) means, connected to the collecting means for supplying displacement gas to the collecting means, so that the pumped fluid collected therein is displaced therefrom, back to the reservoir, through the liquid return line; and

(e) means for diverting the flow of pumped fluid from the pump to the collecting means.

4,073,305

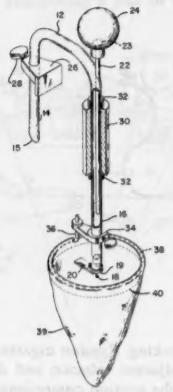
SIPHON PUMP

Amos J. Brown, Alderwood Manor; Thomas E. Belshaw, Seattle; Kenneth L. Knull, Sumner, and Wilbur D. Wilke, Camano Island, all of Wash., assignors to Belshaw Brothers, Inc., Seattle, Wash.

Filed May 20, 1976, Ser. No. 688,175

Int. Cl.[2] F04F *10/02*

U.S. Cl. 137—140 **6 Claims**



1. A siphon pump for removing liquids from a tank comprising:

elongated hollow outer tube means having a first end and a lower second end,

a cap covering the lower end, means for pressing the cap closed,

an elongated hollow inner tube having an outer end outside of said outer tube, extending through said hollow outer tube and terminating upwardly from said lower second end, and

a bulb air pump enclosing said outer end of said inner tube and so adapted that squeezing said air pump blows a pulse of air out said lower end of said outer tube means and upon closing of the lower end by the cap creates a vacuum within the outer hollow tube means to suck the liquids into the first end of the outer tube means to begin a siphoning effect,

said outer tube means including a single tube having a bent central portion, a short leg terminating at said first end and a longer leg terminating at said second end, said inner tube entering the outer tube at the upper end of the longer leg and extending downwardly at least as far as the first end of the shorter leg whereby the liquid is unlikely to reach the bulb air pump during suction.

4,073,306

STEAM TRAP

Robert D. Neyer, Oreland, Pa., assignor to Yarway Corporation, Blue Bell, Pa.

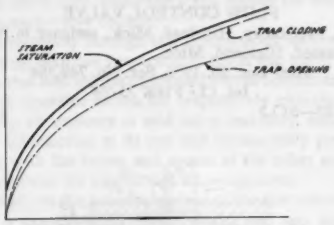
Filed Jan. 27, 1977, Ser. No. 762,846

Int. Cl.[2] F16T *1/02*

U.S. Cl. 137—183 **19 Claims**

1. A steam trap comprising a body including an inlet opening, a discharge opening and a valve seat formed between said inlet and discharge openings, a valve member cooperating with said valve seat to control flow from said inlet opening to said discharge opening, said valve member being movable in a control chamber and being spaced therefrom to form a first

orifice through which fluid can flow to said control chamber, said valve member being formed from a material having a coefficient of thermal expansion different from the material



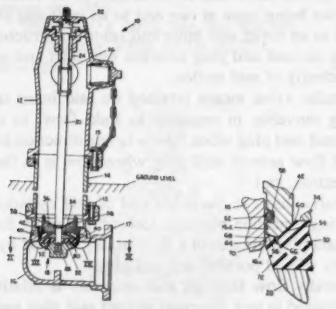
forming said control chamber whereby the size of said orifice and the pressure differential thereacross vary non-linearly with temperature.

4,073,307

VALVE FOR FIRE HYDRANTS

John H. Royce, Traverse City, Mich., assignor to Traverse City Iron Works, Traverse City, Mich.

Filed July 30, 1976, Ser. No. 710,235
Int. Cl.[2] F16K *25/00*
U.S. Cl. 137—283 **19 Claims**



1. A fire hydrant comprising:

a water conduit;

connection means for connecting said conduit to a water supply; and

valve means within said conduit for opening and closing said conduit to or from the supply of water; said valve means including a valve seat member with a fluid passage therethrough secured within an inner surface portion of said conduit, first sealing means for preventing fluid flow between said valve seat member and inner conduit surface, and second sealing means for closing said fluid passageway of said valve seat member; said second sealing means including thereon third sealing means for engaging both said valve seat member and inner conduit surface to provide a supplementary fluid seal which completely closes said conduit and seals off said valve seat member from said water supply.

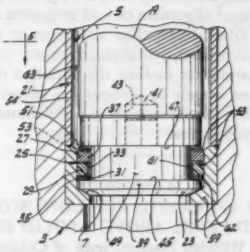
4,073,308

VALVE

Morris Randall Stith, Jr., R.R. #1, Box 13, Webster, Ky. 40176

Filed Oct. 20, 1976, Ser. No. 734,251
Int. Cl.[2] F16L *53/00*
U.S. Cl. 137—340 **25 Claims**

1. A valve comprising a valve body, the latter having a bore therein, an inwardly projecting seat in said bore, an inlet port in communication with said bore on one side of said bore seat, and an outlet port in communication with said bore on the other side of said bore seat, said inlet port, said outlet port, and a portion of said bore interconnecting said inlet and outlet ports constituting a flow passage, said valve further comprising a valve plunger axially movable within said bore, said plunger having a rigid seat thereon and being movable between an open position in which said plunger is substantially clear of said flow passage so that fluid may flow therethrough substantially without restriction by said plunger and a closed position in which said plunger seat is in substantially leak-tight face-to-face engagement with said bore seat, said plunger carrying pressure-actuated seal means for sealing engagement with the



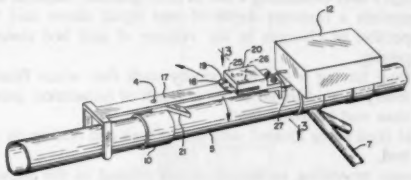
walls of said bore when said plunger is in its closed position, said pressure-actuated seal means comprising a first deformable seal ring sealingly engageable with the walls of said bore, a second deformable seal ring sealingly engageable with said plunger, means for containing said seal rings and for permitting radial expansion of said first sealing ring into sealing engagement with the walls of said bore and of said second sealing ring into sealing engagement with said plunger when said seal rings are subjected to axial compression loading, and means responsive to fluid pressure for applying axial compression loading to said seal rings for axially compressing them and for effecting generally radial expansion of said seal rings into respective sealing engagement with said bore and said plunger.

4,073,309

IRRIGATION APPARATUS

Arthur D. Fraser, and Dwight A. Inglis, both of Walla Walla, Wash., assignors to Raymond D. Harold, Walla Walla, Wash.

Filed Sept. 15, 1976, Ser. No. 723,500
Int. Cl.[2] B05B *3/02*
U.S. Cl. 137—344 **17 Claims**



1. In self-propelled sprinkler irrigation apparatus, an alignment control system connected to said irrigation apparatus for controlling the linear alignment of said irrigation apparatus by causing sections of said irrigation apparatus to move or not move in a predetermined, automatic manner, comprising a misalignment sensor mechanically connected to said irrigation apparatus for sensing possible linear misalignments of said irrigation apparatus, correctable by said alignment control system, and for causing electrical circuits to be established or disestablished in response to the presence or absence of said possible misalignments, said misalignment sensor comprising:

permanent magnet means connected to a section of said irrigation apparatus for generating a field of magnetic flux,

magnetic switch means, operable by said field of magnetic flux and also connected to said section of said irrigation apparatus and electrically connected to said electrical circuits,

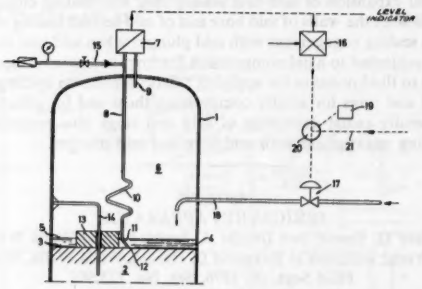
and magnetic shielding means connected to another and adjacent section of said irrigation apparatus in such position as to magnetically shield or not shield said magnetic switch means from said field of magnetic flux in a predetermined fashion thereby causing said magnetic switch means to establish or disestablish said electrical circuits in accordance with said presence or absence of misalignment of said irrigation apparatus.

12. In self-propelled sprinkler irrigation apparatus, an alignment control system connected to said irrigation apparatus for controlling the linear alignment of said irrigation apparatus by causing sections of said irrigation apparatus to move or not move in a predetermined, automatic manner, comprising an electrical delay circuit for causing the initiation of said movement to be delayed in time by an operably adjustable amount, and for causing the termination of said movement to be substantially undelayed in time.

4,073,310
METHOD AND APPARATUS FOR CONTROLLING THE LIQUID LEVEL ABOVE A SOLID BED

Jiri Mikule, and Wilfried Hecken, both of Cologne, Germany, assignors to Industrial Filter & Pump Mfg. Co., Cicero, Ill.

Continuation of Ser. No. 440,867, Feb. 8, 1974, abandoned. This application Sept. 2, 1975, Ser. No. 609,220
Claims priority, application Germany, Feb. 8, 1973, 2306210
Int. Cl. F16k *21/18*
U.S. Cl. 137—389 **2 Claims**



1. Apparatus for controlling the rate of flow of a liquid through a tank containing a bed of solid granular material so as to maintain a constant depth of said liquid above said bed irrespective of changes in the volume of said bed material comprising,

a float having a specific gravity such that when floating freely in said liquid it has a depth of immersion greater than said constant depth,

said float being located within said tank and resting on said bed,

means providing an output signal related to the pressure differential between two fluid inputs thereto,

a conduit connected between one of said inputs and a position near the top of column,

a bubble pipe carried by said float and connected to the other of said inputs, said bubble pipe having a downwardly facing open lower end disposed in proximity to the bottom of said float,

means for passing fluid into and down through said pipe whereby it flows out said open lower end,

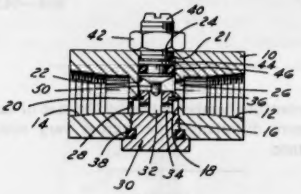
control means responsive to said output signal for controlling the rate of flow of said liquid into said tank to maintain said constant depth of said liquid above said bed, and

time controlled means for periodically supplying liquid to said tank independently of said output signal to maintain a sufficient head of liquid above said bed to cause said float to float above the upper surface of said bed.

4,073,311
FLOW CONTROL VALVE

Donald E. McGeachy, Highland, Mich., assignor to Numatics, Incorporated, Highland, Mich.

Filed Dec. 10, 1976, Ser. No. 749,384
Int. Cl.² F16K *15/14*
U.S. Cl. 137—513.3 **14 Claims**



1. A flow control valve assembly comprising:

a. a housing having a single cylindrical recess extending therethrough,

b. a valve orifice plug in one end of said recess having an inner end and an outer end and an axial passage terminating at the inner end in an orifice to be controlled, said orifice being open at one end to an inlet and at the other end to an outlet said inner end being constructed to allow flow around said plug between said inlet and outlet independently of said orifice,

c. annular valve means retained on said inner end of said plug movable, in response to fluid flow, to close flow around said plug when flow is in one direction and to open said flow around said plug when flow is in the opposite direction, and

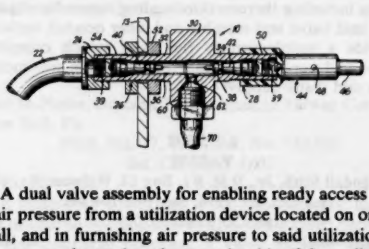
d. a valve insert in the other end of said cylindrical recess having a portion movable toward and away from orifice in said plug to control a flow orifice created by the proximity of said portion and said plug,

whereby flow through said assembly is relatively unrestricted in one direction around said plug and past said annular valve means and is restricted through said orifice in the other direction.

4,073,312
CHARGE AND RELIEF VALVE

Frank J. Voos, Stratford, Conn., and David M. Magoulick, Uniontown, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed June 21, 1976, Ser. No. 698,618
Int. Cl.² F15B *13/04*; F16K *11/00*
U.S. Cl. 137—877 **2 Claims**



1. A dual valve assembly for enabling ready access in relieving air pressure from a utilization device located on one side of a wall, and in furnishing air pressure to said utilization device from a source located on the opposite side of the wall, comprising

(a) a unitary valve structure including a central body section

and first and second integrally formed valves, each valve comprising

(1) a hollow valve cylinder extending from said body section, and

(2) a valve core, including a pin, within the bore defined by each valve cylinder;

(b) a passageway through said central body section communicating with the respective bores in the valve cylinders such that said integrally formed valves constitute independently operable means for respectively charging and relieving air pressure in said valve assembly, said passageway intersecting at its one end substantially perpendicularly with the bores; and means at the other end of said passageway for connecting a hose thereto;

(c) threads on the exterior surface of the first valve cylinder and a cap engaging said threads, said cap including a spring-biased plunger for contacting the pin of the valve core within said first valve cylinder so as to relieve the air pressure;

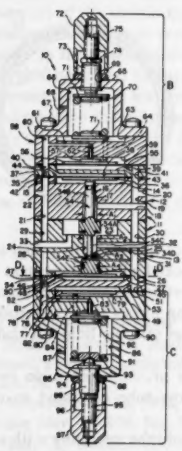
(d) further threads on the exterior surface of the second valve cylinder, and a pair of fastening devices engaging said further threads for engaging respective opposite sides of said wall therebetween so that said valve assembly can be mounted on said wall such that the passageway in said central body section is located on said one side of the wall.

4,073,313

VALVE APPARATUS

John J. Smallwood, King, N.C., assignor to Fairchild Industries, Inc., Germantown, Md.

Filed Dec. 6, 1974, Ser. No. 530,186
Int. Cl.² F16K *11/04, 31/365*
U.S. Cl. 137—625.6 **8 Claims**



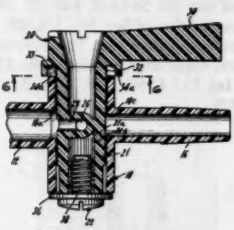
1. Valve apparatus comprising a valve body, said valve body having an inlet and an exhaust valve aperture and a locking piston isolation aperture, supply valve means including a locking piston member located within said valve body for controlling fluid supplied to said valve body, means for isolating said locking piston member from the inlet when the exhaust valve aperture is closed, pressure assist means for permitting the pressure of the fluid controlled by said supply valve means to assist in the positive action of said supply valve means and for permitting the pressure of the fluid being controlled to assist in maintaining said supply valve means in the normally open position, said pressure assist means comprising the exhaust valve aperture and the locking piston isolation aperture where the area of the cross section of the exhaust valve aperture is greater than the area of the cross section of the locking piston isolation aperture, and at least one signal valve associated with said valve body for controlling the operation of said supply valve means.

4,073,314

DISPOSABLE VALVE

Irving A. Speelman, East Williston, and Jan Raczkowski, Glendale, both of N.Y., assignors to Propper Manufacturing Co., Inc., New York, N.Y.

Filed Sept. 8, 1976, Ser. No. 721,421
Int. Cl.² F16K *5/16*
U.S. Cl. 137—625.47 **7 Claims**



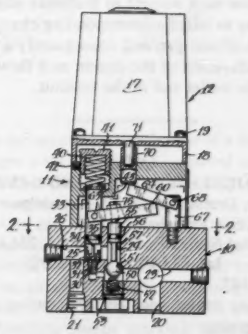
1. A valve comprising: a hollow body having first and second ends and including a plurality of ports in its periphery; a valve core telescoped in said body and adapted to be rotated therein, said core including means for interconnecting groups of said ports when said core is rotated to different positions within said body, said core having a substantially cylindrical longitudinal bore opening toward the first end of said body and splines disposed on the inside of said bore; means for restraining longitudinal movement of said core towards the first end of said body; and securing means, including a substantially cylindrical threaded shaft constructed to be press fitted inside said core bore and to be wedged therein by said splines, for restraining longitudinal movement of said core towards the second end of said body.

4,073,315

VALVE ASSEMBLY

Samuel B. McClocklin, and James C. Solie, both of Owatonna, Minn., assignors to Owatonna Tool Company, Owatonna, Minn.

Filed Jan. 21, 1977, Ser. No. 761,413
Int. Cl.² F16K *1/00*
U.S. Cl. 137—629 **14 Claims**



8. A solenoid valve assembly having a valve body with a pressure port, a return port, and a control port, passage means in said body connecting said ports, first and second valves in said body arranged in parallel in said passage means for blocking fluid flow between the control port and the return port, a

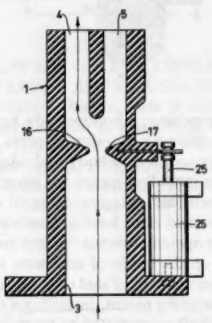
solenoid operable to open said valves, and means interconnecting said solenoid and said first and second valves including first and second levers and a spring whereby initial movement of said levers by operation of the solenoid opens said first valve against the action of said spring and after a reduction of fluid pressure said spring acts to open said second valve.

4,073,316

FLEXIBLE FLOW DIVERTER

K. Sture Nyström, Solna, Sweden, assignor to Skega Aktiebolag, Ersmark, Sweden

Continuation of Ser. No. 553,644, Feb. 27, 1975, abandoned, which is a continuation of Ser. No. 358,354, May 8, 1973, abandoned. This application Oct. 19, 1976, Ser. No. 733,928
Claims priority, application Sweden, June 12, 1972, 7717/72
Int. Cl.² F15C *1/08, 1/14, 1/16*
U.S. Cl. 137—829 **8 Claims**



1. A flow device for a fluid stream to control the direction of said stream, said device comprising a conduit having an inlet for the fluid and at least one outlet for the fluid, said inlet and the or each outlet being separated from each other within said conduit by a gap coaxial with the axis of the conduit and defined by opposed offsettable inner edges of two mutually opposite flexibly mounted stream-deflecting members extending inwardly of said conduit in a direction transverse to the axis of said conduit; the arrangement being such that at least one of the stream-deflecting members is movable relative to the other by flexing that member in a direction parallel to the axis of said conduit whereby said inner edge of said one member is brought out of opposition with respect to the inner edge of the other member thereby to effect a corresponding change in the direction of the axis of said gap and consequently a corresponding change in the direction of the stream as it flows through said gap towards the outlet end of the conduit.

4,073,317

ADJUSTABLE CLAMPING DEVICE

James B. Ellis, Grand Junction, Colo., assignor to Fibreboard Corporation, San Francisco, Calif.

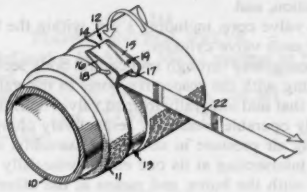
Filed Sept. 20, 1976, Ser. No. 724,418
Int. Cl.² F16L *9/14, 33/02*
U.S. Cl. 138—147 **11 Claims**

1. A clamping device adapted for securing ends of a strap together comprising

a substantially elongated, co-planar and flat body said device terminating at its ends by the end edges of said body,

a pair of flanges secured to opposite sides of said body to define a U-shaped cross section throughout the entire length of said clamping device,

means defining an elongated slot through said body, adjacent a first end edge thereof, to form the sole interruption therein, and



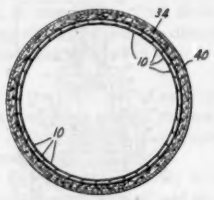
a ring pivotally mounted on said flanges and sized to freely pivot over said first end edge of said body.

4,073,318

PROCESS FOR WEAR-RESISTANT DUCTS

James R. Close, Roberts, Wis., and James R. Johnson, White Bear Lake, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 19, 1976, Ser. No. 743,337
Int. Cl.² F16L *9/14*
U.S. Cl. 138—149 **4 Claims**



1. As an article of manufacture a duct consisting essentially of casing, interlocked abrasion-resistant tile lining and expanded intumescent composition between said tile lining and said casing exerting forces thereon respectively centripetally and centrifugally of said tile lining in said casing of at least 2 Newtons per cm^2.

2. A process for providing abrasion resistance to the inner surface of a hollow tube of round to elliptic cross-section comprising

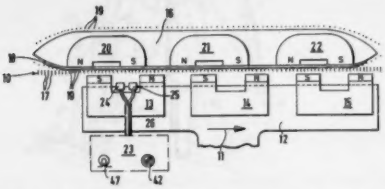
A. Providing said tube internally with a first layer of insulative sheet material expandable to resilient mat means and a second layer of interlocking refractory abrasion resistant tile temporarily positioned inward of said first layer, clearances between said tube and said first and second layers being sufficiently large to permit relative movement between said tube and said second layer and not being greater than the expanded thickness of said insulative sheet material, and

B. Heating said tube under conditions of substantially uniform circumferential heat distribution with said first and second layers in position whereby expansion of said insulative sheet material is effected substantially uniformly so that force is exerted centripetally of said tube on said interlocking tile and centrifugally on said tube of at least 2 Newtons per cm^2 and sufficient to hold said tile in securely interlocked relationship within said tube.

4,073,319
SHUTTLE MONITORING DEVICE, PARTICULARLY FOR MULTIPLE-SHUTTLE WEAVING MACHINES

Adolf Linka, Hechingen-Sickingen, and Gerhard Hamma, Spaichingen, both of Germany, assignors to Mayer & Cie, Tailfingen, Germany

Filed Sept. 22, 1976, Ser. No. 725,529
Claims priority, application Germany, Oct. 4, 1975, 2544530
Int. Cl.[2] D03D *49/44, 51/40, 47/26*
U.S. Cl. 139—134 **8 Claims**



1. In a weaving machine, particularly a multiple-shuttle weaving machine, of the type in which the shuttle is provided with at least one shuttle magnet, and in which magnetic drive means moves along the shed and acts upon the shuttle magnet to effect positive magnetic transport of the shuttle through the shed, a shuttle monitoring device, the shuttle monitoring device comprising, in combination, a magnetic-field-dependent resistor for each shuttle to be monitored; means for transporting the magnetic-field-dependent resistor in parallel with and in synchronism with the drive means and in a region where the resistor is influenced by at least one pole of the shuttle magnet during the entire transport of the shuttle through the shed, whereby during transport of the shuttle through the shed the magnetic-field-dependent resistor will remain in a predetermined position relative to the at least one pole of the shuttle magnet so long as a predetermined relative position between the magnetic drive means and the at least one shuttle magnet is being maintained; and machine shutoff means connected to the resistor and operative for shutting off the drive means for the weaving machine in response to a resistance change of the resistor indicative of improper relative position between the drive means and the shuttle magnet and thus lack of proper shuttle movement.

4,073,320
DOUBLE CATCH THREAD NARROW WEAVE FABRIC

Junior C. Spence, Stuart; Robert J. Rorrer, Woolwine, and James L. Holt, Stuart, all of Va., assignors to J.P. Stevens & Co., Inc., New York, N.Y.

Division of Ser. No. 527,438, Nov. 26, 1974, Pat. No. 4,004,617. This application Nov. 1, 1976, Ser. No. 737,319
Int. Cl.[2] D03D *23/00*
U.S. Cl. 139—383 R **9 Claims**

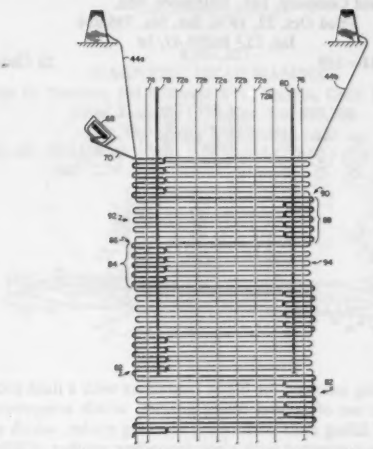
1. A woven fabric comprising:

a plurality of warp threads forming a first edge warp, a main warp and a second edge warp;

a shuttle thread forming a predetermined number of exterior loops about said first edge warp, said shuttle thread further extending across all of said warp threads in an interwoven fashion, and said shuttle thread further forming a predetermined number of exterior loops about said second edge warp;

a first catch thread being interwoven in said main warp, looping around said shuttle thread, and forming a predetermined number of exterior loops about said first edge warp opposite said exterior loops formed by said shuttle thread about said second edge warp; and

a second catch thread being interwoven in said main warp, looping around said shuttle thread, and forming a predetermined number of exterior loops about said second edge

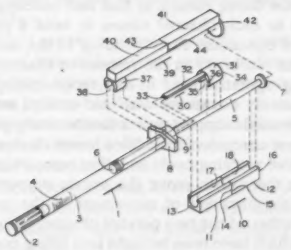


warp opposite said exterior loops formed by said shuttle thread about said first edge warp.

4,073,321
ADJUSTABLE BLOCKING MEANS FOR DOSAGE REGULATION

George Moskowitz, 101 B. Rutledge Ave., Charleston, S.C. 29401

Filed Mar. 15, 1976, Ser. No. 666,957
Int. Cl.[2] B65B *3/04*
U.S. Cl. 141—27 **18 Claims**



1. A device for regulating the dosage of a fluid in a syringe having a plunger with a fluid-holding barrel and a stop at the top of said fluid-holding barrel comprising blocking means removeably secured to the plunger of the syringe placed between the plunger end of the syringe and the stop at the top of the syringe fluid-holding barrel, said blocking means comprising a top portion, a bottom portion, two side portions, two end portions, and an arcular trough type opening extending from one end portion to the other end portion through said top portion; said blocking means working automatically without being held manually;

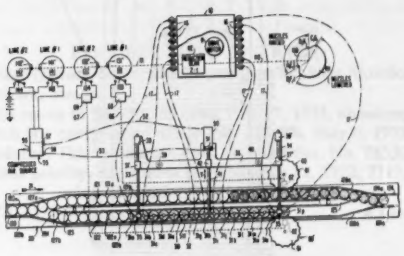
whereby, during the filling of the filling of the syringe, when said plunger end is pressed toward said top, said blocking means allows any excess fluid to be rejected from said fluid-holding barrel, retaining only the desired dosage of said fluid in said barrel.

4,073,322

HIGH-SPEED FILLING MACHINE

Richard Nelson Bennett, Arbutus, Md., assignor to National Instrument Company, Inc., Baltimore, Md.

Filed Oct. 22, 1976, Ser. No. 735,034
Int. Cl.[2] B65B 43/54
U.S. Cl. 141—169 23 Claims



1. A filling machine for filling containers with a fluid product by the use of several filling nozzles, which comprises a number of filling units performing working cycles, which are operatively connected with a corresponding number of filling nozzles and are operable for filling containers with the fluid product by way of the nozzles during the working cycles thereof, nozzle support means supporting thereon the filling nozzles in proper position, means for lowering and raising the nozzle support means and therewith the filling nozzles into and out of containers held under the filling nozzles, indexing means for holding containers stationary in their filling positions during the filling operation on a continuously running conveyor means, and control means for controlling the operation of the filling machine including means correlating the operation of the indexing means and the lowering and raising of the nozzle support means with the working cycle of the filling units, characterized in that two substantially parallel channel means defined in part by said conveyor means are provided which branch out from a single channel means upstream of the filling station and which recombine again into a single channel means downstream of the filling station, in that said indexing means are coordinated to each channel means to hold a predetermined number of containers corresponding to the number of the filling nozzles stationary in the respective channel means during the filling operation, and in that reciprocating means which are operatively connected with said control means are provided for the nozzle support means to alternately place the filling nozzles over containers to be filled in one channel means during a respective working cycle and after completion of the filling operation thereof, to move the nozzle support means transversely to the direction of movement of the conveyor means over the other of the two parallel channel means to fill the containers which have been brought into filling position in the meantime in said other channel means during the next working cycle and which are held stationary thereat during the filling operation of such working cycle by the respective indexing means.

4,073,323

TUBING DEFLECTOR

Eldon Dwayne East, 4522 Casa Oro Drive, Yorba Linda, Calif. 92686

Filed June 30, 1976, Ser. No. 701,225
Int. Cl.[2] B65B 3/00
U.S. Cl. 141—326 9 Claims

1. A deflector utilizable with a receptacle having a plurality of openings therein for receiving elements in selected ones of said openings as a function of the position of said deflector;

said deflector comprising;

a pivot member;

a plate-like member joined to said pivot member;

an abutment member joined to said pivot member;

said pivot member mounted in said receptacle between said openings such that said plate-like member covers one of

said openings when in an initial position and said abutment member extends into a further opening; and

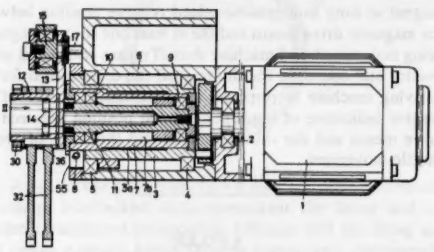
bias means for establishing said initial position of said plate-like member.

4,073,324

SLOT-MORTISING OR MORTISING MACHINE

Max Mayer, Holzheim, Germany, assignor to Max Mayer Maschinenbau GmbH, Germany

Filed Feb. 13, 1976, Ser. No. 657,725
Claims priority, application Germany, Mar. 13, 1975, 2511081
Int. Cl.[2] B27F 5/02
U.S. Cl. 144—82 14 Claims



1. A mortising machine, comprising:

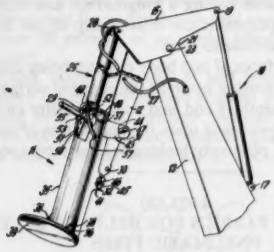
a motor having a housing; a rotatable drive shaft extending from said motor and out of said housing; a tubular guide casing mounted so as to be nonshiftable with respect to said motor housing; said casing having an opening therein which is concentric with said drive shaft;

an outer sleeve positioned inside said tubular casing opening, said outer sleeve being supported by and being rotatable in said tubular casing opening concentrically of said motor drive shaft; said outer sleeve being connected to said drive shaft for being rotated thereby; said outer sleeve having an outer sleeve bore therein which is eccentric to said motor drive shaft;

a tool carrier shaft supported in said outer sleeve bore and rotatable with respect to said outer sleeve, whereby as said outer sleeve is rotated concentrically of said drive shaft, said tool carrier shaft moves eccentrically;

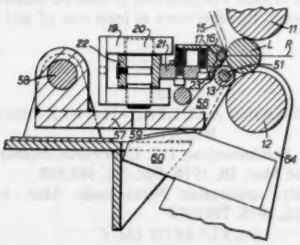
rotation control means connected to said tool carrier shaft for limiting rotation thereof in said outer sleeve bore as said outer sleeve is rotated, whereby said tool carrier shaft has limited rotation about its axis.

4,073,325
WOOD-SPLITTING ATTACHMENT
Cecil Krom, Jr., P.O. Box 282, Napanoch, N.Y. 12458
Filed Oct. 12, 1976, Ser. No. 731,518
Int. Cl.[2] A47J 49/02
U.S. Cl. 144—193 A 7 Claims



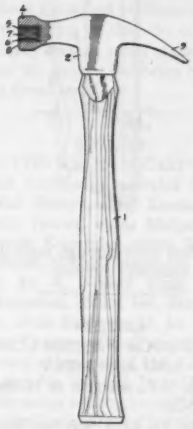
1. A wood-splitting attachment for removable attachment to the end of the dip stick of a backhoe, said backhoe having a controlled hydraulic system with a piston and cylinder extending along the upper surface of the dip stick, said wood-splitting attachment including:
- an elongated concave trough, said elongated concave trough having an inside end and an outside end;
- a means for attaching said elongated concave trough, to the dip stick of a backhoe, said elongated concave trough being longitudinally aligned with said dip stick with the outside end of said elongated concave trough extending beyond the outside end of said dip stick;
- means for attaching a wedge means to the piston of the piston and cylinder extending along the upper surface of said dip stick;
- a stop means rigidly attached to the outside end of said elongated concave trough at substantially right angles to said elongated concave trough; and
- a clamp means for securing the cylinder of said piston and cylinder along the longitudinal axes of said elongated concave trough.

4,073,326
VENEER-PEELING MACHINES
John C. Pank, Pretoria, and Ronald L. E. Clegg, Durban North, both of South Africa, assignors to Lion Match Company Limited, England
Filed Aug. 18, 1976, Ser. No. 715,400
Claims priority, application United Kingdom, Sept. 5, 1975, 36560/75
Int. Cl.[2] B27L 5/02
U.S. Cl. 144—209 R 10 Claims



1. A veneer peeling machine comprising a frame, three rollers, means mounting said rollers in said frame for rotation on mutually parallel axes, first and second of the rollers being so mounted and so movable relative to each other and to the third roller as to grip and rotate a log disposed between the three rollers, a knife and means supporting the knife relative to a said log to peel a veneer therefrom as the log is rotated by the rollers.

4,073,327
MAGNETIC HEAD HAMMER
Ottis D. Pearson, 104 Gillcrest Ave., Vallejo, Calif. 94590
Filed June 11, 1976, Ser. No. 695,088
Int. Cl.[2] B25C 1/00; B25D 1/00
U.S. Cl. 145—30 A 2 Claims

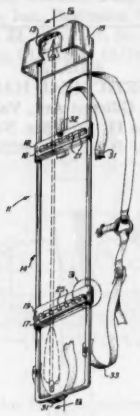


1. A hammer having a magnetic driving head said head comprising:
- a drop-forged driving end of heat treated steel having a driving face positioned thereon;
- a recessed section counterbored through said face in said end;
- a shield member of relatively hard non-magnetic metal;
- a permanent magnet member tightly pressed into said shield member;
- said shield member and said magnetic member being tightly pressed into said recessed section to form a flush surface with said driving face; whereby said magnetic member forms a part of said driving face;
- said magnetic member being further characterized by the complete absence of cushioning or impact absorbing means in connection therewith;
- said shield member being further characterized by a cup-like configuration enclosing all but one surface of said magnetic member said one surface forming a part of said driving face.

4,073,328
ARROW QUIVER
Dwaine R. Franklin, 1845 Arizona Ave., Yuma, Ariz. 85364
Filed May 9, 1977, Ser. No. 795,096
Int. Cl.[2] A63B 67/00
U.S. Cl. 150—1.5 R 10 Claims

1. An arrow quiver including in combination:
- an elongated frame member having an abutment member located at one end thereof and extending outwardly from the plane of said frame member; and
- a bridge member mounted across said frame member on the same side as said abutment member, said bridge member being formed of resilient material and having a plurality of tapered slots therein, each of such slots for accommodating and gripping the shaft of an arrow and the slots each

being tapered with the narrow end thereof on the side of the bridge nearest said abutment member for impeding



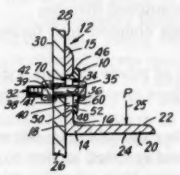
sliding of an arrow shaft through such slot in a direction away from said abutment member.

4,073,329

WEDGE SHAPED LOCK WASHER CONSTRUCTION AND ASSEMBLY

Alfred A. Hala, Islip, N.Y., assignor to Hohmann & Barnard, Inc., Hauppauge, N.Y.

Filed Nov. 10, 1976, Ser. No. 740,383
Int. Cl.[2] F16B *39/24*
U.S. Cl. 151—20 **73 Claims**



1. A washer for use in conjunction with a fastening system for rigidly locking a first member relative to a second member, one of said members having an aperture formed therein for receiving a fastener adapted to extend through said washer and having an enlarged outer end for engagement with said washer, said first and second members being provided with planar surfaces of engagement permitting adjustment relative to each other along a common plane and being normally subjected to external forces tending to shift said members relative to each other in one direction,

said washer comprising a body element having oppositely disposed ends and spaced apart substantially planar surfaces intermediate said ends, said surfaces being inclined relative to each other, one of said surfaces being capable of engagement with one of said members in abutting relationship therewith and the other of said surfaces being inclined relative thereto.

means cooperating with the aperture in said one of said members for permitting removable positional securement of said body element relative to the aperture in said one of said members,

said body element having an elongated slot extending between said oppositely disposed ends and through said spaced apart surfaces, said slot being positionable in alignment with said aperture for receiving said fastener therethrough, the enlarged outer end of said fastener extending beyond said surfaces for securing said members and said washer together,

said fastener having a longitudinal axis disposed in substantially parallel relationship to a plane which extends through and which is disposed at substantially right angles to said spaced apart substantially right angles to said spaced apart substantially planar surfaces,

said elongated slots having a longitudinal axis disposed in substantially perpendicular relationship to the longitudinal axis of said fastener, and

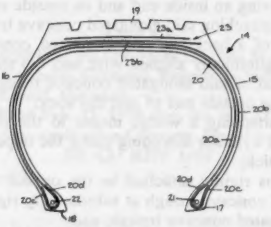
said inclined surfaces of said body element being disposed in wedging relationship between the engaged surface of said one of said members and said enlarged outer end of said fastener in dependence upon the application of said external forces for positively locking said members together.

4,073,330

TIRE CORD FABRICS FOR BELTS OF BELTED PNEUMATIC TIRES

Claude H. Allard, Toronto, Canada, assignor to Uniroyal, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 451,322, March 14, 1974, abandoned. This application June 21, 1976, Ser. No. 697,893
Int. Cl.[2] B60C *9/22*
U.S. Cl. 152—361 DM **7 Claims**



1. A belted tire comprising a toroidal carcass terminating at its radially inward-most edges in a pair of beads, a tread surrounding the region of said carcass, sidewalls outlying the lateral regions of said carcass from said beads to the marginal regions of said treads, and a tread-reinforcing belt structure disposed circumferentially of the crown region of said carcass beneath said tread, said belt structure including at least one ply of a plurality of first continuous filament tire cords in which the filamentary elements are exclusively of metal wire and a plurality of second continuous filament tire cords in which the filamentary elements are exclusively of a high modulus non-metallic synthetic fiber, each ply of said belt structure having all said cords extending in the same direction in closely spaced, non-intertwined, side by side, relation and being interspersed with one another in such a fashion that at least some of said first cords have disposed therebetween at least one of said second cords.

4,073,331

DEVICE FOR MAKING A CURTAIN HANG IN REGULAR PLEATS

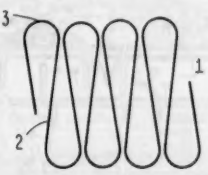
Edwin Zilver, v. Beethovenlaan 115, Doorwerth, Netherlands

Filed Mar. 10, 1976, Ser. No. 665,558
Claims priority, application Netherlands, Mar. 6, 1976, 7602237; Mar. 13, 1975, 7502979
Int. Cl.[2] A47H *13/14*
U.S. Cl. 160—348 **3 Claims**

1. A device for making a curtain hang in regular pleats, said device capable of assuming two positions, the first position being prior to an elastic deformation of said device and the second position being after elastic deformation of said device, comprising:

an oblong bent shaped resilient member of a plastic material which is a zig-zag type shape such that it can be subjected to an elastic deformation from said first position into said second position and vise versa, said resilient member having a pre-determined total length measured along said zig-zagged shape portions and having two ends, wherein the linear distance between said ends of said resilient member is greater in said second position than in said first position, said linear distance in said second position being at least 50 percent of said total length of said resilient member;

connecting means provided at said ends of said resilient member for connecting said resilient member to another oblong bent shaped resilient member, said connecting means comprising a male connector located at one of said ends and a female connector at the other of said ends



wherein said female connector includes an opening and said male connector comprises an embossment, which is provided with a central opening with slits extending radially from said central opening; and

attaching means for connecting a hanger to said resilient member, said attaching means including a mandrel for engagement with said central opening of said embossment of said male connector,

whereby said male connector provides connecting means for connecting said resilient member to another resilient member by inserting said male connector into said female connector and whereby said male connector of said resilient member also provides means for engagement with said mandrel of said attaching means to enable connection of a hanger at the point where said resilient members are connected.

4,073,332

METHOD OF CONTROLLING CONTINUOUS CASTING OF A METAL

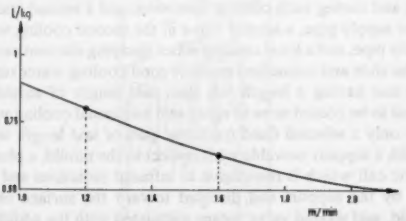
Arlette Thérése Etienne, Boncelles, Belgium, assignor to Centre de Recherches Metallurgiques Centrum Voor Research in de Metallurgie, Brussels, Belgium

Filed Sept. 23, 1975, Ser. No. 615,846

Claims priority, application Belgium, Sept. 26, 1974, 820408; Oct. 9, 1974, 820889; Mar. 21, 1975, 827040; Luxembourg, Apr. 13, 1975, 72732

Int. Cl.² B22D *11/16*

U.S. Cl. 164—4 **6 Claims**



1. A method of controlling the continuous casting of a metal by a continuous casting machine having a liquid-cooled mould in which primary cooling of the molten metal occurs to form a metal strand having a liquid core, issuing from the mould, and passing through a series of secondary cooling zones to which a coolant is supplied through respective flow-control valves, the method comprising the steps of: starting the casting machine at an optimum casting speed; measuring the casting speed, which will vary owing to changes in the rate at which molten metal enters the mould; measuring the surface temperature of the strand in each of the secondary cooling zones; from the measured temperatures and the measured casting speed, determining by means of a computer the time taken by a sector of the metal to pass from its entry into the casting machine to its exit from each of the secondary cooling zones and a specific coolant flow rate at which the coolant is to be supplied to each of the secondary cooling zones in order to maintain a desired thermal profile along the strand at the measured casting speed; and controlling the valves so that the coolant is supplied to each of the secondary cooling zones at the rate determined for that zone, the specific coolant flow rate being reduced as the measured casting speed increases.

4,073,333

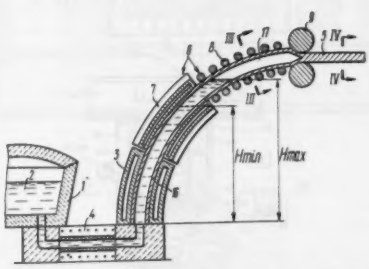
METHOD OF CONTINUOUS CASTING OF INGOTS

Evgeny Alexeevich Korshunov, pereulok Otdelny, 5a, kv. 29; Nikolai Ivanovich Bainov, ulitsa Kominterna, 20/17, kv. 1; Igor Nikolaevich Petrov, ulitsa Malysheva, 152b, kv. 30; Georgy Fedorovich Konovalov, ulitsa Bazhova, 130/79, kv. 17, all of Sverdlovsk; Mikhail Iosipovich Arshansky, prospekt Lenina, 23/40, kv. 8, Nizhny Tagil; Petr Genrikhovich Shmidt, ulitsa Gagarina, 35, kv. 186, Sverdlovsk; Valery Pavlovich Kostrov, ulitsa Bazhova, 57, kv. 10, Sverdlovsk, and Petr Evgenievich Efremov, ulitsa Tolyatti, 28, kv. 6, Novokuznetsk Kemerovskoi oblasti, all of U.S.S.R.

Continuation of Ser. No. 535,153, Dec. 23, 1974, abandoned, which is a continuation of Ser. No. 422,151, Dec. 6, 1973, abandoned. This application June 23, 1976, Ser. No. 699,173

Int. Cl.² B22D *11/04, 11/08*

U.S. Cl. 164—66 **5 Claims**



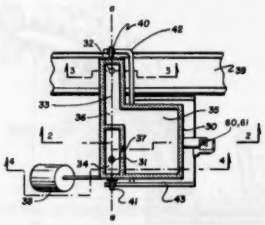
1. A method of continuous casting of an ingot in a plant provided with a vessel for molten metal, a device for the forced feeding of a molten metal, a radially curved cooled mould, a dummy bar having a through channel in its middle portion along its height, and a secondary cooling device with a radial upcast branch, comprising the steps of: (a) introducing the dummy bar into the radially curved cooled mould; (b) forced feeding a molten metal from the vessel into the mould from a bottom until the molten metal contacts the dummy bar and simultaneously forces out air through the channel in the dummy bar; (c) increasing the pressure of the molten metal applied to an ingot skin being formed and holding the ingot skin being formed to a prescribed thickness; (d) reducing the pressure at the end of the holding; (e) drawing an ingot from the mould to a value close to, but not exceeding the length of the mould at a rate of drawing that ensures the presence of a molten metal layer on a lower butt portion of the skin; (f) forming a hole in the skin of the ingot, made through the channel in the dummy bar during one period of drawing the ingot after reducing the pressure therein; (g) supplying a neutral gas to an inner space of the ingot through the channel in the dummy bar and the hole in the ingot skin, in an amount

ensuring the equalizing of the level of the molten metal in the mould to a level close to the level of the molten metal in the vessel, as well as forming a gas cushion in an upper portion of the ingot; (h) feeding the molten metal into the inner space of the ingot when the ingot is being drawn from the mould and when a pause starts, in an amount that ensures a pressure causing the fitting of the skin of the ingot along the mould; (i) decreasing the rate of the ingot drawing until the drawing discontinues completely, the supply of the molten metal continuing; (j) returning the ingot to the mould to a distance close to the distance of the longitudinal contraction of a new portion of the ingot being formed; (k) continuing the feed of the molten metal in the direction of the ingot drawing until a preset pressure is created on the newly formed portion of the ingot; (l) repeating the steps (h)-(k) until formation of an upcast branch of the ingot; and (m) straightening and reducing a continuous section of an upper portion of the upcast branch of the ingot, the section being an ingot envelope spaced from the gas cushion to a distance corresponding to the size of a formed lower portion of the ingot, drawn out of the mould.

4,073,334
TILTING TUNDISH

Charles Christian Gerding, Pittsburgh, Pa., assignor to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed Nov. 4, 1976, Ser. No. 738,923
Int. Cl.² B22D *11/06, 11/10*
U.S. Cl. 164—87 **9 Claims**



1. A method for dispensing a substantially constant flow of liquid, comprising:

a. feeding a pulsating flow of liquid into a container that is rotatably supported by a bearing surface having a horizontal axis that is generally coplanar with an opening in said container for receiving said liquid and an opening in said container for dispensing said liquid, said container adapted to hold variable amounts of said liquid and extending laterally beyond said horizontal axis, so as to cause said container to rotate about said axis due to a change in torque applied to said container caused by the change in volume of contained liquid;

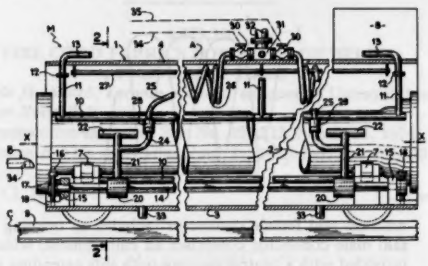
b. applying a countertorque from a counterweight system to said container to balance the change in torque caused by said change in volume of liquid, said countertorque being applied on an amount to cause the container to rotate about said axis to a position where the height of said liquid over said dispensing outlet remains essentially constant with the liquid height prior to application of said countertorque; and

c. dispensing a substantially constant flow of liquid under the influence of gravity from said dispensing outlet.

4,073,335
COOLING DEVICE FOR IRON PIPE CENTRIFUGAL CASTING MACHINE

Pierre Henri Marie Fort, Nancy, and Michel Pierrel, Pont-A-Mousson, both of France, assignors to Pont-A-Mousson S.A., Nancy, France

Continuation of Ser. No. 564,190, April 1, 1975, abandoned. This application Sept. 27, 1976, Ser. No. 727,098
Claims priority, application France, Apr. 1, 1974, 74 11569
Int. Cl.² B22D *13/02*
U.S. Cl. 164—154 **12 Claims**



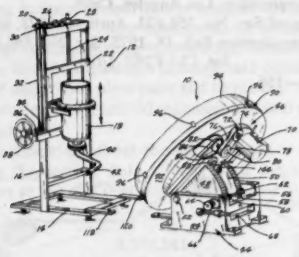
10. A structure comprising in combination a machine for centrifugally casting iron pipes and comprising a rotary mould having an axis of rotation, means for pouring iron into the mould which pouring is achieved by a relative axial movement between said pouring means and the mould, a device for cooling the mould, said device comprising in combination a first cooling water supply pipe, a first valve in the first cooling water supply pipe, cooling water spraying systems connected to the first cooling water supply pipe and extending throughout a length of the mould required to be cooled and capable of supplying cooling water normally required for cooling the mould and an additional cooling water spraying means for spraying any additional localized cooling water found to be required to achieve a cooling of the mould which is substantially uniform throughout said length of the mould, said additional cooling water spraying means comprising a guide bar parallel to the axis of the mould, a slide slidably mounted on the bar to be movable independently of said relative movement between the mould and pouring means merely for purposes of adjustment of the slide to a desired fixed position relative to the mould axially of the mould which position remains fixed for each and during each cooling operation, and a second cooling water supply pipe, a second valve in the second cooling water supply pipe, and a local cooling water spraying element carried by the slide and connected to the second cooling water supply pipe and having a length less than said length of mould required to be cooled so as to spray said additional cooling water onto only a selected fixed fractional part of said length of the mould, a support movable with respect to the mould, a photoelectric cell which is responsive to infrared radiations and carried by the support and directed toward the surface of the mould, said second valve means associated with the additional water spraying element for controlling the supply of water to the additional water spraying element also associated with the photoelectric cell to be controlled in accordance with the infrared radiations detected by the photoelectric cell, the second valve being operative independently of the first valve.

4,073,336

CENTRIFUGAL CASTING MACHINE

Edward A. Roe, R.R. No. 6, Box 26, Omaha, Nebr. 68112, and Harold F. Schulte, 3009 Cass St., Omaha, Nebr. 68131

Filed Sept. 30, 1974, Ser. No. 510,372
Int. Cl.[2] B22D *13/04*
U.S. Cl. 164—286 5 Claims



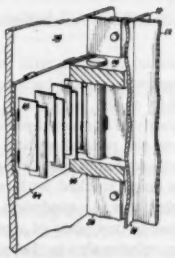
1. A centrifugal casting machine, comprising,
a support means,
a mold means rotatably mounted on said support means,
power means for rotating said mold means,
means operatively pivotally connecting said mold means to said support means about a horizontal axis, whereby the rotational attitude of said mold means may be selectively varied relative to said support means,
a non-rotatable housing means pivotally secured to said support means,
said mold means comprising a rotatable mold member rotatably mounted within said housing means,
a drive shaft secured to said mold member and extending through said housing means,
said power means being connected to said drive shaft for rotating said mold member relative to said housing means, said drive shaft having a passageway means formed therein extending therethrough for supplying a gaseous material to the interior of said mold member,
said drive shaft having first and second ends, said first end being centrally disposed within said mold member, said second end being disposed outwardly of said housing means,
and a gas deflector plate mounted on said first end of said drive shaft.

4,073,337

ROTARY REGENERATOR PIN RACK SEAL

Richard Franklin Stockman, Friendship, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed July 12, 1976, Ser. No. 704,220
Int. Cl.[2] F28D *19/00*
U.S. Cl. 165—9 5 Claims



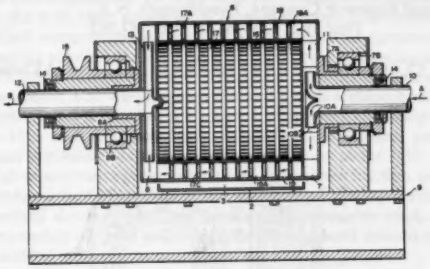
1. A regenerative heat exchange apparatus having a central rotor post, a concentric rotor including a mass of heat absorbent material carried by the rotor post, housing means surrounding the rotor having inlet and outlet ports at opposite ends thereof for a low pressure heating fluid and a high pressure fluid to be heated, bearing means supporting the rotor within the housing for rotation about its axis, sector plates adjacent ends of the rotor lying between ports in the housing to separate the several fluids, axial sealing plates extending axially through the space between the rotor and the rotor housing between ends of the sector plates, an annular drive rack extending circumferentially around the rotor, means engaging the annular drive rack to rotate the rotor about its axis, and baffle means intermediate the axial sealing plates and the annular drive rack adapted to preclude fluid flow therebetween, said baffle means comprising a series of axially disposed plate members carried by the axial sealing means to confront the annular drive rack and restrain fluid flow past the irregular surface of the drive rack that would have a sandblasting effect upon the adjacent parts of the rotor and the rotor housing.

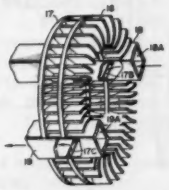
4,073,338

HEAT EXCHANGERS

Kenji Fujikake; Isamu Amaki, and Masatoshi Suzuki, all of Nagoya, Japan, assignors to Toyota Chuo Kenkyusho, Nagoya, Japan

Continuation of Ser. No. 482,464, June 24, 1974, abandoned.
This application July 27, 1976, Ser. No. 709,174
Claims priority, application Japan, June 26, 1973, 48-72429
Int. Cl.[2] F28D *11/60;* A01F *12/44*
U.S. Cl. 165—86 32 Claims





1. A heat exchanger having a rotor for generating a stream of a first working fluid and for effecting a heat exchange between said first working fluid being drawn across the exterior surfaces of the rotor and a second working fluid flowing within said rotor, said rotor being rotatably supported in said stream of first working fluid and comprising:
a plurality of hollow annular passage means coaxially disposed in planes extending perpendicularly to the rotor axis and spaced in predetermined intervals therealong, said hollow annular passage means for containing said second working fluid during heat exchange;
a plurality of solid plates secured between said annular passage means and positioned coaxially with respect to said rotor to form plate surfaces extending parallel to the longitudinal axis of the rotor in order to generate said stream of said first working fluid and to provide a princi-

pal means for said heat exchange between said first and second working fluids;

at least one distribution-suction passage means having a first opening at one end thereof and at least one concentration-delivery passage means having a second opening at one end thereof, said distribution-suction and concentration delivery passage means being secured to said annular passage means and positioned oppositely to each other with respect to the longitudinal axis of said rotor and substantially parallel with said axis, and being intercommunicated with said

hollow annular passage means for forming a system of internal ducts in said rotor; and

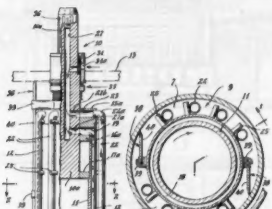
port means connected to said openings of said distribution-suction passage means and concentration-delivery passage means for sucking said second working fluid thereinto and delivering said second working fluid therefrom through each of said openings thereof so that said second working fluid is sucked into said distribution-suction passage means through said port means and flows through said plurality of hollow annular passage means, said concentration delivery passage means and said port means, and so that the heat exchange between the stream of said first working fluid, which stream is generated by said plurality of plates, and said second working fluid is accomplished by said plurality of solid plates.

4,073,339

SWEPT SURFACE HEAT EXCHANGER

James Alvin D'Orsay, Georgetown, Maine, assignor to The De Laval Separator Company, Poughkeepsie, N.Y.

Filed Dec. 6, 1976, Ser. No. 747,912
Int. Cl.² F28F 7/00
U.S. Cl. 165—94 **4 Claims**



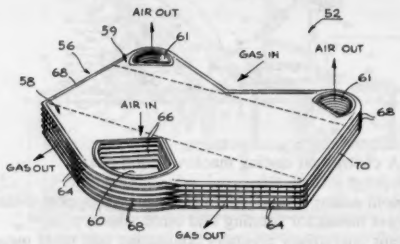
1. In a swept surface heat exchanger having a pair of concentric cylinders forming between them a first passage for throughflow of a first heat exchange medium, the inner cylinder defining a treatment chamber for throughflow of a product to be heated or cooled by said medium, a rotor comprising a shaft mounted for rotation in said chamber substantially on the axis of said inner cylinder, the shaft having a cylindrical outer surface and forming a second passage for throughflow of a second heat exchange medium to heat or cool said outer surface, a plurality of tubes each having opposite ends secured to the shaft and each having an intermediate portion extending outside the shaft in spaced relation to said outer surface thereof, one end portion of the shaft having a medium inlet leading via the shaft to adjacent ends of said second passage and said tubes, the other end portion of the shaft having a medium outlet to which adjacent ends of said second passage and said tubes lead via the shaft, scraper means protruding from the rotor between adjacent tubes and operable to sweep the inner surface of said inner cylinder, and stationary means surrounding said first end portion of the shaft in sealed relation thereto for supplying said second medium to said medium inlet.

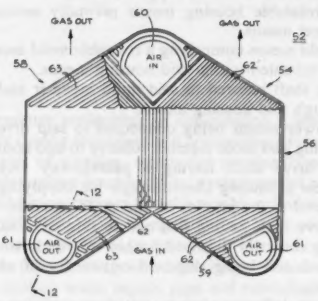
4,073,340

FORMED PLATE TYPE HEAT EXCHANGER

Kenneth O. Parker, Rolling Hills Estates, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Continuation of Ser. No. 351,423, April 16, 1973, abandoned.
This application Feb. 18, 1975, Ser. No. 550,895
Int. Cl.² F28F 3/00
U.S. Cl. 165—166 **17 Claims**





1. Heat exchanger apparatus of the counter-flow type having inlet and outlet manifolds integrally combined with the heat exchanger core comprising:

a plurality of formed thin plates each having an offset flange extending about its periphery, each having a central section between opposed end sections, each of said end sections having at least one completely enclosed opening therein with an offset collar portion extending at least partially around said opening, the collar portions of each plate constituting segments of the respective inlet and outlet manifolds;

first and second pluralities of fin elements interspersed with the plates;

the plates being brazed together with interspersed ones of said first fin elements by pairs in back-to-back abutting and sealed relationship at the peripheral flanges thereof to define a first plurality of contained passages for the flow of a first fluid across the central section in a first direction between the inlet and outlet manifold segments;

said pairs of plates being stacked with interspersed ones of said second fin elements in a sandwich configuration with the collar portions of one plate of a pair being joined by brazing in sealing relationship to the corresponding collar portions of an adjacent plate of an adjacent pair to define a second plurality of passages for the flow of a second fluid around said end section openings and across said center section in a second direction generally parallel but

opposed to said first direction in layers interspersed with the layers of said first fluid passages, the collar portions of the succession of stacked plate pairs defining integral first fluid manifolds which consist of said manifold segments;

adjoining surfaces of said first and second pluralities of fin elements and said plates being brazed together to establish, with said brazed-together collar portions and peripheral flanges, a rigid, self-contained structure for withstanding internal pressurization without deformation;

said collar portions being configured to define first fluid openings communicating between said manifold segments and the first fluid passages through said center section in each of said joined plate pairs and to prevent communication between said manifold segments and said second fluid passages; and

a housing extending about the heat exchanger core for directing the second fluid to and from the second fluid passages at the end portions of the stacked plates.

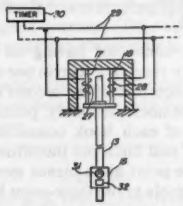
4,073,341
ACOUSTICALLY CONTROLLED SUBSURFACE SAFETY VALVE SYSTEM

William H. Parker, Hurst, Tex., assignor to Del Norte Technology, Inc., Euless, Tex.

Continuation-in-part of Ser. No. 294,289, Oct. 2, 1972, Pat. No. 3,961,308, and Ser. No. 629,515, Nov. 6, 1975. This application May 3, 1976, Ser. No. 682,196

Int. Cl.² E21B *43/00, 33/03*

U.S. Cl. 166—65 R **15 Claims**



1. A system for communicating into deep wells comprising a tubing extending from a point near the surface of the earth downwardly to remote points, signaling means attached to said tubing near the upper end thereof and operating upon the upper portion of said tubing for selectively exciting with sonic energy the tubing wall which acts as a sonic energy transmission line extending from said exciter means to said remote point, remotely controlled means near the remote point for performing at least one desired function, detection means associated with the tubing for detecting said sonic energy when transmitted through the transmission line formed along the length of the tubing wall, means responsive to said detection means for converting said sonic energy transmitted through said line into mechanically effective signals for controlling said remotely controlled means, and means for applying said converted signals to said remotely controlled means.

4,073,342
SAND CONSOLIDATION METHOD

Bobby G. Harnsberger, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 23, 1976, Ser. No. 753,761

Int. Cl.² E21B *33/138, 43/02*

U.S. Cl. 166—295 **10 Claims**

1. A method of treating an oil-containing incompetent formation penetrated by a well bore to prevent the movement of unconsolidated sand particles from said incompetent formation to the well bore as the oil is recovered from said formation which comprises the sequential steps of:

1. Injecting a liquid hydrocarbon containing a minor amount of a water wetting nonionic surface active agent and from about 0.5 to about 3% of water into said formation to remove any excess water present therein;
2. Injecting a first treating solution composed of from about 3 to 20% by volume of a inorganic silicon halide and 80 to 97% by volume of a hydrocarbon solvent into the sand formation being consolidated;
3. Injecting a liquid hydrocarbon into the sand formation to effect removal of any excess inorganic silicon halide from the area being consolidated;
4. Injecting a second treating solution composed of from about 3 to about 20% by volume of furfuryl alcohol and from about 80 to 97% of a high in aromatics (80% or more) petroleum fraction into said consolidation area and permitting said second treating solution to contact said first treating solution;
5. Shutting in said well for a period sufficient to effect polymerization and curing of the polymerizable components of said first and second treating solutions, and formation of an oil permeable but sand impermeable barrier therein.

4,073,343
SAND CONSOLIDATION METHOD

Bobby G. Harnsberger, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 23, 1976, Ser. No. 753,760

Int. Cl.² E21B *33/138, 43/02*

U.S. Cl. 166—295 **10 Claims**

1. A method of treating an oil-containing incompetent formation penetrated by a well bore to prevent the movement of unconsolidated sand particles from said incompetent formation to the well bore as the oil is recovered from said formation which comprises injecting into said incompetent formation a treating solution consisting essentially of, on a volume basis, 10 to 25% of furfuryl alcohol, 1 to 4% of a nonionic dispersing surfactant, 1 to 4% of water, 0.5 to 1.5% of a silane bonding agent, 1 to 5% of a furfuryl alcohol polymerization catalyst, 5 to 15% of a low-in-aromatics (about 20% maximum) petroleum distillate fraction, and from about 47 to about 76% of a high-in-aromatics (above about 80%) petroleum fraction, polymerizing the furfuryl alcohol component, permitting the polymerized alcohol to set and form a fluid permeable sand, and recovering oil from said formation through said formed consolidated sand.

4,073,344
METHODS FOR TREATING SUBTERRANEAN FORMATIONS

Bobby E. Hall, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Division of Ser. No. 533,375, Dec. 16, 1974. This application Feb. 28, 1977, Ser. No. 772,706

Int. Cl.² E21B *43/27*

U.S. Cl. 166—307 **6 Claims**

1. A method of improving the permeability of a siliceous formation comprising the steps of:

preflushing said formation with an aqueous hydrochloric acid solution containing at least one additive for imparting desired properties to said solution and to said formation and containing a chemical having the property of reducing the adsorption of said additive on silicate surfaces present in said formation, said chemical being present in said aqueous hydrochloric acid solution in an amount in the range of from about 1% to about 90% by volume of said acid solution-chemical mixture and having the general formula:

$$C_nH_{2n+1}(OC_2H_4)_xOH$$

wherein:

n has a value in the range of from about 4 to about 12;

x has a value in the range of from about 1 to about 10;

and the total number of carbon atoms in said chemical is greater than 12;

treating said formation with an aqueous hydrochloric-hydrofluoric acid treating solution capable of dissolving mineral constituents contained in said formation; and

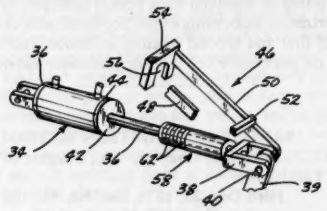
recovering said preflush and treating solutions from said formation.

4,073,345

DISC HARROW WHEEL LOCK-DOWN WITH DEPTH CONTROL ADJUSTMENT STRUCTURE

Maurice E. Miller, Stratton, Nebr. 69043

Filed Feb. 14, 1977, Ser. No. 768,202
Int. Cl.[2] A01B *63/22*
U.S. Cl. 172—413 **9 Claims**



9. In combination,

a frame means having rearward and forward ends,

means on the forward end of said frame means for connection to a prime mover,

a wheel means operatively secured to said frame means and vertically movable with respect thereto so that said frame means may be moved between first and second positions,

said wheel means, when in its said first position, causing said frame means to be moved upwardly relative to the ground,

said wheel means, when in its said second position, permitting said frame means to move downwardly towards the ground,

a hydraulic cylinder comprising a cylinder body having a cylinder rod movably extending therefrom,

said hydraulic cylinder being secured to said frame means and said wheel means for moving said wheel means between the said first and second positions,

said cylinder rod being in an extended position when said wheel means is in its said first position,

and movable lock means operatively pivotally connected to the outer end of said cylinder rod and movable between first and second positions,

a spacer assembly selectively longitudinally movably mounted on said cylinder rod,

said lock means being in operative engagement with said spacer assembly when said spacer assembly is adjacent said cylinder body and said lock means is in its first position to prevent said cylinder rod from slidably moving inwardly into said cylinder body,

said lock means permitting said cylinder rod to move inwardly into said cylinder body when said spacer assembly is not positioned adjacent said cylinder body.

4,073,346

COMBINATION TRACTOR AND FARM IMPLEMENT HITCH MEANS

Roger L. Groth, Battle Creek; Randall L. Harvey, Davenport; Thomas R. Lauer, Iowa City, all of Iowa, and Morris L. Ronnebaum, Bismarck, N. Dak., assignors to Iowa State Univ. Research Foundation, Inc., Ames, Iowa

Filed June 4, 1976, Ser. No. 692,934
Int. Cl.[2] B60D *1/00*; A01B *59/043*
U.S. Cl. 172—439 **2 Claims**

1. In a tractor and farm implement hitch means including a first implement connectible in a three-point hitch connection in a trailing relation with a tractor having a three-point hitch means and connectible in a three-point hitch connection in a towing relation with a second implement having front hitch means including a pair of transversely spaced hitch pins, the combination comprising:

(a) said tractor three-point hitch means which includes:

(1) a center arm, and

(2) a pair of transversely spaced lift arms pivotally connected to the tractor and extended rearwardly therefrom, and

(b) said first implement which includes:

(1) an elongated transverse tool bar,

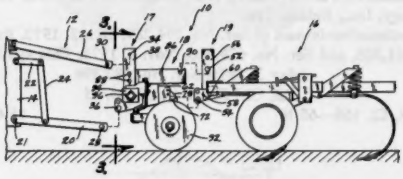
(2) a rear three-point hitch means comprising:

(a) a center link operatively connected to the tool bar and extended rearwardly thereof,

(b) a connector at the rear end of the center link connectible with the front hitch means of the second implement,

(c) a pair of draft links rigidly secured to the tool bar and extended rearwardly therefrom at positions below and arranged at opposite sides of the center link,

(d) a hook connector at the rear end of each draft link,



each hook connector having an upwardly facing open side for receiving therein one of the transversely extended hitch pins of the second implement, and

(e) a lock member releasably positionable over said open side of each hook connector to prevent the removal of said hitch pin therefrom, and

(3) a front three-point hitch means mounted on the tool bar and attachable to the three-point hitch means on the tractor, said front three-point hitch means having a pair of transversely spaced upstanding mast plates on the tool bar and an upper hitch pin extended between the upper ends of the mast plates for attachment to the center arm of the tractor three-point hitch means, and said center link of the rear three-point hitch means is rigidly connected to the mast plates and extended rearwardly therefrom, and

(4) the first implement, when alone connected to the three-point hitch means of a tractor, being movable therewith and towed thereby, and when the front three-point hitch means of the second implement is connected to the rear three-point hitch means of the first implement, both of said implements being movable as a unit with and towed by the hitch means of the tractor.

4,073,347

SPRING-LOADED CLAMP FOR AN EARTH-WORKING TOOL SHANK

Marvin J. Philpot, New Berlin, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 6, 1976, Ser. No. 747,693
Int. Cl.[2] A01B *19/02*
U.S. Cl. 172—710 **19 Claims**

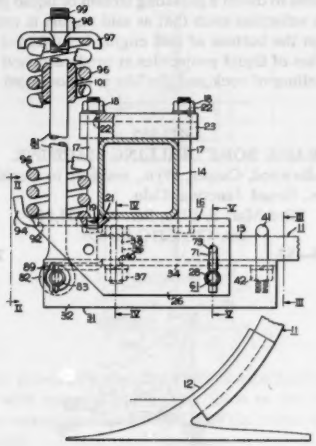
13. In a spring-loaded clamp for the shank of an earth-working tool having a frame, the combination comprising:

a clamping member releasably secured to said frame including a pair of laterally spaced vertical walls having aligned openings,

a rockable member releasably secured to the upper end of said shank including a pair of laterally spaced vertical walls which are in side-by-side relation with said vertical

walls on said clamping member and present aligned openings,

a bushing having opposite ends in the aligned openings of only one of said members, said ends of said bushing being in axially confronting relation to said walls of said other member, and said bushing being nonrotatable relative to said one member,



a pin extending through said bushing and having its opposite ends in the aligned openings of the other of said members, said pin being nonrotatable relative to said other member, and

spring means operatively interposed between said clamping and rockable members biasing said shank toward an earth-working position.

4,073,348

IMPACT DRILLING TOOL

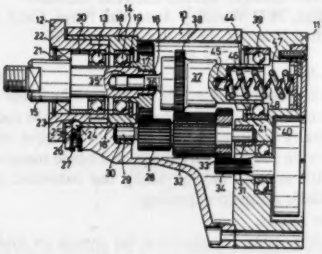
Heribert Schramm, Stuttgart, and Steffen Wuensch, Dettenhausen, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed July 13, 1976, Ser. No. 704,783

Claims priority, application Germany, July 25, 1975, 2533284

Int. Cl.[2] E02D 7/02

U.S. Cl. 173—48 **20 Claims**



1. A power drill tool comprising in combination, a housing; a spindle element mounted in said housing for rotation about an axis and for displacement in an axial direction; drive means for rotating said spindle element; and means for subjecting said spindle element to axially oriented impacts, including an impact element mounted in said housing at least for reciprocation in direction of said axis, means for reciprocating said impact element driven by said driven means, a blind axially oriented bore in said spindle element and having a first impact surface, and an axially oriented extension on said impact element and received in said blind bore of said spindle element and having a second impact surface which impacts said first impact surface upon axial displacement of said impact element in direction towards said spindle element.

4,073,349

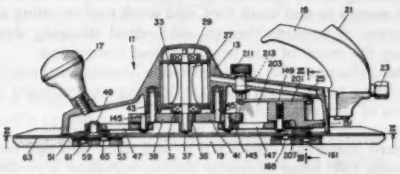
BALANCED RECIPROCATING TOOL DRIVEN BY ROTARY MOTION

Kunio A. Sumida, Los Angeles, Calif., assignor to Robert H. Siegel and Maurice Albin, Chicago, Ill., as coexecutors of the estate of Leonard V. Shapiro, deceased

Continuation of Ser. No. 461,519, April 17, 1974, abandoned, which is a continuation-in-part of Ser. No. 261,096, June 8, 1972, abandoned. This application Jan. 8, 1976, Ser. No. 647,338

Int. Cl.[2] B23B 17/00

U.S. Cl. 173—59 **25 Claims**



1. A reciprocatable hand tool machine comprising

a housing,

a rotary motor mounted in said housing,

means for actuating said rotary motor,

first drive means in said housing, said first drive means including a first gear driven by said rotary motor,

second drive means in said housing, said second drive means including a second gear driven by said first gear in a first rotary direction and a third gear driven by said first gear in the same rotary direction,

a work-operating tool mounted on said housing for axial movement relative to said housing,

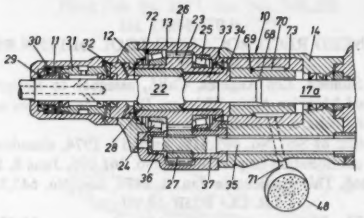
reciprocatable means mounted in said housing for axial reciprocation relative to said housing, the reciprocatable means being balanced relative to said work-operating tool and

link means interconnecting said second drive means with said tool and with said reciprocatable means for reciprocating said tool and said reciprocatable means in opposite directions, said link means including a first eccentric having a first end mounted on said second gear for rotation with said gear and having a second end mechanically coupled to said work-operating tool and further including a second eccentric having a first end mounted on said third gear for rotation with said third gear and having a second end mechanically coupled to said reciprocatable means, one of the eccentrics being angularly offset through a particular distance relative to the other eccentric during the reciprocation of the work-operating tool and the reciprocatable means in opposite directions.

4,073,350
DEVICE FOR DAMPING THE RECOIL OF A WORK TOOL CONNECTED TO A PERCUSSION TOOL

Åke Torsten Eklöf, Skarholmen; Per Tage Allan Fengsborn, Amal, and Gunnar Vigg Riss Romell, Djursholm, all of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Mar. 8, 1976, Ser. No. 665,056
Claims priority, application Sweden, Mar. 18, 1975, 7503097
Int. Cl.[2] B25D 9/00
U.S. Cl. 173—139 14 Claims



1. A recoil damping device for a percussion tool which includes a work tool (22), a machine housing (10) coupled to said work tool and adapted to apply a feeding force forwardly to said work tool in a working direction, a hammer piston (17) reciprocating in the machine housing and adapted to deliver impact energy to said work tool, said work tool recoiling after application of impacts thereto, said recoil damping device damping the recoil of said work tool and comprising:

a retard chamber (70) in said machine housing, said machine housing having a surface (73) defining the rearward portion of said retard chamber,

a pressurized hydraulic fluid in said retard chamber,

a retard piston (68) connected to said work tool said retard piston (68) being normally during operation a predetermined forward position which is remote from said surface (73) of said retard chamber (70),

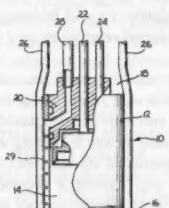
said retard piston (68) having a piston surface (69) which confines axially the retard chamber (70) towards the work tool, and

means for maintaining hydraulic pressure in said retard chamber during operation to maintain said retard piston (68) and said work tool out of axial contact rearwardly with said surface (73) and said machine housing.

4,073,351
BURNERS FOR FLAME JET DRILL

Werner Baum, Canoga Park, Calif., assignor to Pei, Inc., Malibu, Calif.

Filed June 10, 1976, Ser. No. 694,592
Int. Cl.[2] E21B 7/14
U.S. Cl. 175—14 11 Claims

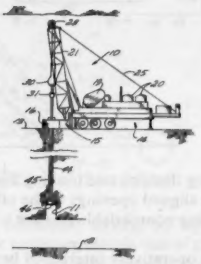


1. A rotatably mounted drill bit engine for liquid fuels having particular utility in a flame jet drill comprising an axially elongated body with a combustion chamber disposed therein, at least one flame jet nozzle opening through said body adjacent the bottom thereof so as to communicate with said combustion chamber, and a first set of liquid jet nozzles disposed on said engine adjacent said bottom thereof, said flame jet nozzle and said first set of liquid jet nozzles mounted substantially parallel to the axis of said body, said first set of liquid jet nozzles configured to direct a pulsating stream of liquid jet projectiles at high velocities such that as said engine is rotated, the area adjacent the bottom of said engine is subjected to flame jets and pulses of liquid projectiles at predetermined intervals whereby spalling of rock and the like is encouraged.

4,073,352
RAISE BORE DRILLING MACHINE

Gene E. Underwood, Casper, Wyo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Mar. 3, 1976, Ser. No. 663,546
Int. Cl.[2] E21C 23/00
U.S. Cl. 175—53 77 Claims



1. In a method of raise bore drilling in which a drill string extends in a pilot hole between a raise bore drilling bit at the lower end of the pilot hole and a drill string drive means above and adjacent the upper end of the pilot hole, the drill string drive means including means operable for applying torque and axial tension to the drill string while affording axial motion of the drill string, the improvement comprising using a drill string which is non-round, except at spaced periodic locations along the elongate extent of the drill string, for transmitting torque and axial tension from the drive means to the bit.

4,073,353
SONIC LARGE BORE EARTH AUGER

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406

Filed Mar. 22, 1976, Ser. No. 669,385
Int. Cl.[2] E21B 7/04
U.S. Cl. 175—56 5 Claims

1. In an earth hole boring auger having cutter blade means and drive means for driving said cutter blade means rotatably around a centrally positioned axis, the improvement wherein means are provided to sonically drive said blade means unidirectionally with arcuate motion along the extended cutting edge of said blade means comprising:

resonant bar means,

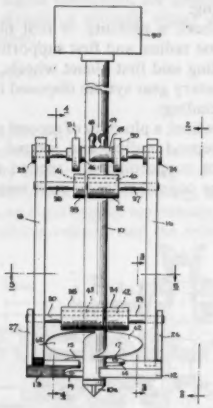
means for supporting the resonant bar means on said drive means for rotation therewith, said resonant bar means being supported with a vibratory energy delivering portion thereof in proximity to a face portion of said cutter blade means located radially out from said centrally positioned axis and opposite to the cutting edge thereof,

a mechanical oscillator having an orbiting rotor connected to said resonant bar means, and

drive means for rotatably driving the rotor of said oscillator means so as to set up resonant standing wave vibrations of the resonant bar means,

whereby resonant energy is transferred from said bar means

to said cutter blade means in unidirectional torque pulses increasing in vibrational amplitude radially from said axis so as to vibrationally drive the cutting edge of said cutter means against the earthen material with arcuate vibration



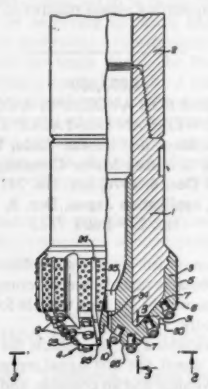
which provides a shearing type of vibratory turning action with resonant pulverizing force as the cutter blade drive means simultaneously drives the cutter blade means rotatably.

4,073,354

EARTH-BORING DRILL BITS

David S. Rowley; Bruce H. Walker, both of Salt Lake City; Coy M. Fielder, Granger, all of Utah, and Heino J. Rohde, Nienhagen, Germany, assignors to Christensen, Inc., Salt Lake City, Utah

Filed Nov. 26, 1976, Ser. No. 745,087
Int. Cl.[2] E21B *9/36, 13/01*
U.S. Cl. 175—329 32 Claims



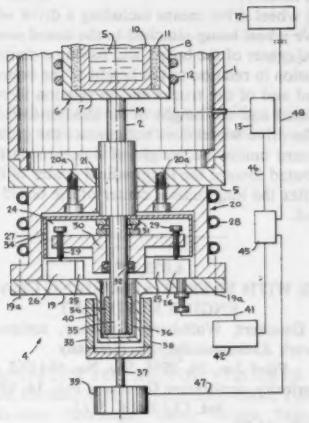
1. An earth-boring bit comprising a metallic shank, having a tubular bore, one end of said shank coated with a hard material bonded to said end and forming a face of said bit, circumambient steps extending across the face of said bit from the central portion of the bit to adjacent the gage of the bit, said steps including a rise and a land, sockets in said hard material of said face positioned between a rise and a land of said steps, preform cutters mounted in said sockets in a plurality of longitudinal arrays spaced from each other about said face, each of said cutters including a plurality of abrasive particles bonded into a preform, said preform cutters formed with a cutting face and back.

4,073,355

CRUCIBLE

Walter Schmidt, and Walter Stählin, both of Schaffhausen, Switzerland, assignors to Prolizenz AG., Chur, Switzerland

Filed Feb. 26, 1976, Ser. No. 661,438
Claims priority, application Switzerland, Apr. 14, 1975, 5461/75
Int. Cl.[2] G01G *17/00*
U.S. Cl. 177—83 20 Claims



1. A weighing device, particularly for the automatic regulation of a crystal-growing operation, comprising

an upright shaft;

journalling means journalling said shaft for rotation;

load supporting means carried by said shaft and adapted for supporting a load in form of a melt to be weighed so that the weight of said load acts lengthwise of and is borne by said shaft;

weight-responsive signal generating means comprising at least one cell which produces an electric current by semiconductor deformation, of a magnitude which varies as a function of the degree of mechanical compression exerted by the load to which said cell is subjected;

mounting means suspending said shaft on said signal generating means so that the weight of said load is transmitted to said cell of said signal generating means; and

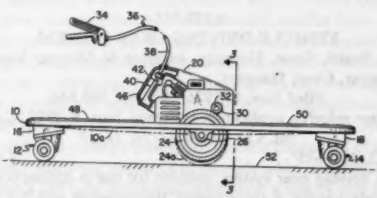
drive means for rotating said shaft without physically engaging the same and without deteriorating or physically influencing the axial freedom of motion of said shaft.

4,073,356

MOTORIZED SKATEBOARD

Dennis Roman Schlicht, 4231 ½ Ocean Blvd., San Diego, Calif. 92109

Filed Jan. 24, 1977, Ser. No. 761,682
Int. Cl.[2] A63C *17/12*
U.S. Cl. 180—1 G 8 Claims



1. In a motorized skateboard, comprising;

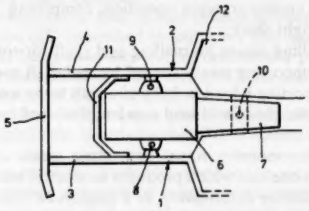
a resilient elongated board for supporting a person riding on the board;
a pair of trucks attached to the board under opposite end portions of the board for supporting the board above the ground; and
a motor supported on the board; wherein the improvement comprises:
a fifth wheel drive means attached to the board and coupled to the motor for driving the board in response to operation of the motor;
the fifth wheel drive means including a drive wheel;
said drive wheel being attached to the board near the longitudinal center of the board, and having a diameter of such dimension in relation to the height of the board above the ground and of the trucks and in relation to resiliency of the board and the height of its attachment to the board that the drive wheel does not contact the ground to drive the board unless the weight of a person on the board is distributed toward the longitudinal center of the board so as to flex the longitudinal center of the board toward the ground.

4,073,357

VEHICLE WITH ENERGY ABSORBING CHASSIS AND ENGINE RESTRAINT

Hermann Danckert, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Germany

Filed Jan. 30, 1976, Ser. No. 654,055
Claims priority, application Germany, Feb. 14, 1975, 2506303
Int. Cl.[2] B60K *5/12*
U.S. Cl. 180—64 R **2 Claims**



1. A motor vehicle comprising:
a chassis having frontal energy absorbing members;
an engine unit;
vibration-dampening, releasable mounts for attaching said engine unit to said chassis behind said energy absorbing members;
and a rigid transverse chassis member arranged behind said energy absorbing members and a short distance in front of said engine unit to enter into force transmitting contact with said engine unit only after release of said mounts and commencement of motion of said engine unit relative to the chassis in the direction of vehicle travel, thereby restraining the forward motion of said engine unit with respect to said chassis on the occurrence of a frontal collision.

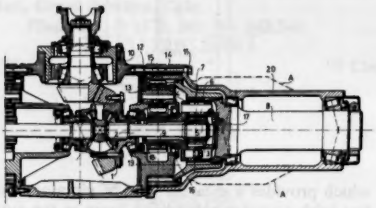
4,073,358

VEHICLE DRIVING GEAR SYSTEM

Gábor Szalai, Gyor, Hungary, assignor to Magyar Vagon- es Gepgyar, Gyor, Hungary

Filed Nov. 8, 1976, Ser. No. 740,346
Claims priority, application Hungary, Nov. 3, 1975, GA 2727
Int. Cl.[2] B62M *11/16, 11/18*
U.S. Cl. 180—75 **4 Claims**

1. A driving gear system, suitable for use in connection with a vehicle having a three speed transmission and for use in connection with a high-power vehicle having an adjustable track width;
said vehicle including a differential gear system having first bearing means;
said driving gear system comprising, in combination:
a bridge housing mounted on said vehicle;
a first planetary gear system disposed in said bridge housing and including:
a first sun wheel; a plurality of first planet wheels, each having a first radius; and first supporting means operable for supporting said first planet wheels;
a second planetary gear system disposed in said bridge housing and including:
a second sun wheel; a plurality of second planet wheels, each having a second radius; and second supporting means operable for supporting said second planet wheels and mounted for coaxial rotation with respect to said second sun wheel;



said second radii being smaller than said first radii;
said first bearing means being disposed in said first supporting means;
housing shells connected to said bridge housing;
connecting means operable for connecting said housing shells to a central portion of said bridge housing and for connecting said first supporting means to said bridge housing;
said first sun wheel being mounted on a portion of said second supporting means for rotation therewith; and
second bearing means disposed between said first and second supporting means and operable to allow the rotation of said second supporting means relative to said first supporting means.

4,073,359

BRAKING SYSTEM FOR AVOIDING A COLLISION OF A VEHICLE WITH AN OBSTACLE THEREOF

Norio Fujiki, Yokohama, and Hiroshi Endo, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Dec. 6, 1976, Ser. No. 747,475
Claims priority, application Japan, Dec. 8, 1975, 50-144954
Int. Cl.[2] B60T *7/12*
U.S. Cl. 180—98 **5 Claims**

1. A braking system for avoiding a collision of a travelling vehicle with an obstacle ahead thereof, comprising:
radar means mounted in use on a vehicle for emitting a radar signal forwardly;
a radar sensor mounted on the vehicle for producing a first and a second signal, the first signal representing a distance between the vehicle and an obstacle, and the second signal representing the relative velocity between the vehicle and the obstacle;
a vehicle velocity sensor mounted on the vehicle, sensing the vehicle velocity to produce a third signal representing the same;
first means connected to the radar sensor for receiving the first and the second signal therefrom, generating, based on the received signals, a sixth signal if the following formula is satisfied,

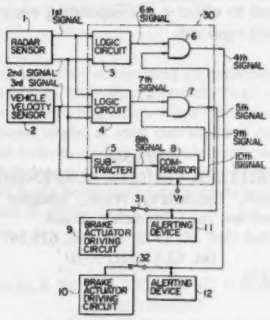
$$V_r^2/2a \geqq R$$

where

V_r: is the relative velocity
α: is the deceleration of the vehicle
R: is the distance between the vehicle and the obstacle;
second means connected to both the radar sensor and the vehicle velocity sensor for receiving the first, the second, and the third signal therefrom, for generating, based on the received signals, a seventh signal if the following formula is satisfied,

$$V_r(2V_a - V_r)/2\alpha \geq R$$

where
V_a: the vehicle velocity;
third means connected to both the radar sensor and the vehicle velocity sensor for receiving the second and the third signals therefrom, for generating, based on the received signals, an eighth signal representing the difference between the vehicle velocity and the relative velocity;



a comparator connected to the third means for receiving the eighth signal therefrom, generating a ninth signal if the magnitude of the eighth signal is greater than that of the ninth signal, and generating a tenth signal if the magnitude of the eighth signal is smaller than that of the ninth signal;
a first AND gate connected to both the first means and the comparator for receiving the sixth and the tenth signal therefrom, for generating a fourth signal if the sixth signal coincides with the tenth signal, the fourth signal representing a collision imminence with a stationary obstacle;
a second AND gate connected to the second means and the comparator for receiving the seventh and the ninth signals therefrom, for generating a fifth signal if the seventh signal coincides with the ninth signal, the fifth signal representing a collision imminence with a moving obstacle; and
two brake actuator driving circuits connected to the collision imminence computing unit, responding to the fourth and the fifth signals, respectively.

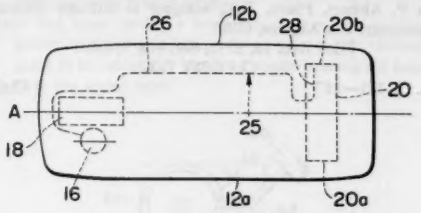
4,073,360

ARRANGEMENT OF FUEL SYSTEM IN MOTOR VEHICLE

Kuniyuki Watanabe, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Oct. 19, 1976, Ser. No. 733,703
Claims priority, application Japan, Oct. 20, 1975, 50-142655[U]
Int. Cl.² B60R *27/00*; B65D *25/00*
U.S. Cl. 180—104 **4 Claims**

1. In a motor vehicle having an elongated vehicle body having first and second lateral walls and a fuel system including a carburetor disposed in a position laterally deviated from a vehicle longitudinal centerline in the direction toward the first lateral wall, a fuel tank extending laterally of the vehicle body to cross the vehicle longitudinal centerline and terminating at its first and second side walls which are respectively directed toward the first and second lateral walls and a fuel return line establishing communication between the carburetor



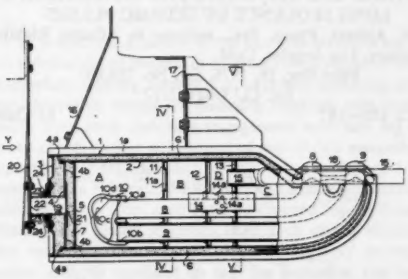
and the fuel tank, the improvement comprising said fuel return line arranged to communicate with the interior of said fuel tank in close proximity to said second side wall.

4,073,361

MUFFLER FOR MOTOR VEHICLES

Kozo Murota, Isezaki; Rempei Matsumoto, Ohta; Toru Yasuma, Ohta; Mamoru Morinaga, Ohta; Shigeo Tajima, Ohta; Masayuki Nakamura, Ohta, and Akira Sakaguchi, Ohta, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 20, 1975, Ser. No. 633,916
Claims priority, application Japan, Nov. 30, 1974, 49-146160[U]
Int. Cl.² F01N *1/08, 7/16, 1/10*
U.S. Cl. 181—228 **11 Claims**

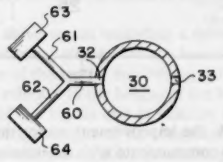


1. A muffler for use in an exhaust system of an internal combustion engine for a motor vehicle, comprising an inner shell, a heat insulating layer covering said inner shell, an outer shell covering said heat insulating layer, wall means for partitioning the space in said inner shell into at least two compartments including a first compartment and a second compartment, two exhaust pipes inserted into said muffler from an end thereof, said exhaust pipes passing through said second compartment, being inserted into and opening in said first compartment so as to discharge engine exhaust gases thereinto, passage means provided in said wall means for communicating said compartments with each other, respectively, said compartments and said passage means comprising expansion chambers and communicating openings to provide noise silencing operation, and a tail pipe communicating with a last of said at least two compartments in said inner shell and having an outlet for discharging the exhaust gases into the atmosphere.

4,073,362
CHARGING AND IGNITION SYSTEM FOR GAS EXPLODERS

Tom P. Airhart, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 16, 1976, Ser. No. 751,406
Int. Cl.[2] G01V 1/12
U.S. Cl. 181—117 6 Claims

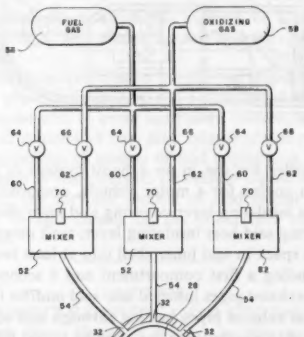


1. In a gas exploder including a housing having an expansible detonation chamber therein, a charging and ignition system comprising:
(a) separate fuel gas and oxidizing gas supply means;
(b) an external main gas flow conduit extending into communication with the interior of said detonation chamber;
(c) at least two branch conduits defining separate gas flow paths interconnected with said main conduit externally of said detonation chamber;
(d) at least two gas mixers, each connected to said fuel gas and oxidizing gas supply means and to the upstream end of a respective one of said branch conduits;
(e) means for controlling the flow from said supply means to said mixers so that said mixers sequentially provide a combustible gas mixture to said main conduit through the downstream ends of their respective branch conduits; and
(f) spark ignition means for separately igniting said combustible gas mixture adjacent said at least two gas mixers in timed relation to the operation of said mixers.

4,073,363
METHOD AND APPARATUS FOR GENERATING A LONG SEQUENCE OF SEISMIC PULSES

Tom P. Airhart, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 16, 1976, Ser. No. 751,407
Int. Cl.[2] G01V 1/12
U.S. Cl. 181—117 13 Claims

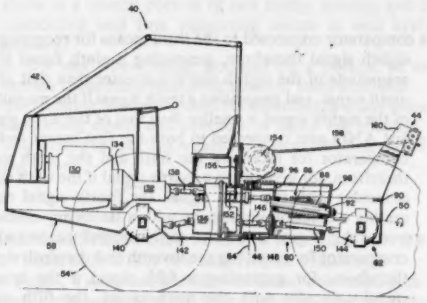


1. A rapid fire gas exploder for generating an extended sequence of seismic pulses comprising:
(a) means defining an expansible closed chamber having a rigid bottom adapted to be coupled to the ground and a rigid top movable reciprocally relative to said bottom;
(b) a plurality of separate fluid conduit means affixed to said chamber in constant communication with the interior thereof;
(c) a like plurality of separate gas mixers whose outputs are connected respectively to said fluid conduit means externally of said chamber;
(d) means for supplying fuel gas and oxidizing gas to each of said mixers;
(e) means for controlling said supply means so that said mixers operate in sequence at a desired rate of fire to provide successive charges of combustible gas mixture; and
(f) means for spark igniting said charges of combustible gas mixture adjacent each of said mixers in timed relation to the operation of said control means, thereby creating a series of detonations within said chamber at said rate of fire adapted to effect a corresponding reciprocal movement of said rigid top.

4,073,364
STABILIZED VEHICLE SUSPENSION

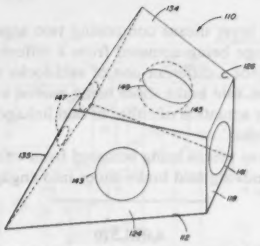
Wilhelm Schmidt, Enumclaw, Wash., assignor to Garrett-Weldco Industries, Inc., Enumclaw, Wash.

Filed Oct. 24, 1975, Ser. No. 625,367
Int. Cl.[2] B62D 5/10
U.S. Cl. 180—139 6 Claims



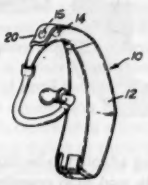
1. A vehicle adapted to travel over irregular terrain, comprising:
a first-end chassis having a pair of transversely spaced wheels;
an intermediate chassis connected to said first-end chassis through an articulation joint, said articulation joint having an articulation axis substantially perpendicular to the transverse and longitudinal axis of the respective first-end and intermediate chassis;
steering means for pivoting said first chassis with respect to said intermediate chassis about said articulation axis;
a second-end chassis having a pair of transversely spaced wheels; and
oscillating connector means rotatably connecting said intermediate chassis to said second-end chassis, said connector means having an axis of rotation extending generally along the longitudinal axis of said intermediate chassis and inclined upwardly toward said second-end chassis such that said axis passes above the center of gravity of said second-end chassis whereby said second-end chassis is in stable condition when the wheels of said second-end chassis lose contact with a vehicle-supporting surface.

4,073,365
SPEAKER SYSTEM
Joseph W. Johnson, 802 E. 227th St., Bronx, N.Y. 10466
Filed July 11, 1977, Ser. No. 814,302
Int. Cl.[2] H04R *1/02, 1/20*
U.S. Cl. 181—147 4 Claims



1. A speaker assembly comprising an enclosure body having at least six surfaces including a bottom wall, an upstanding front wall, two upstanding side walls which intersect said front wall at an obtuse angle, at least one inclined rear wall which intersects said bottom wall at an acute angle and an inclined top wall which intersects said front wall at an obtuse angle, said enclosure body being provided with at least one acoustic speaker affixed to each of said front, side, rear and top walls.

4,073,366
DISPOSABLE NOISE REDUCING HEARING AID ATTACHMENT
Roger Q. Estes, c/o P. H. Shelledy, Esq., Peyton Bldg., Spokane, Wash. 99201
Filed July 26, 1976, Ser. No. 708,316
Int. Cl.[2] G10K *13/00*; H04R *25/00*
U.S. Cl. 181—158 8 Claims



1. A disposable noise reducing hearing aid attachment for attaching to a hearing aid that has a housing with a sound inlet formed therein of a specified cross-sectional area to transmit audible sound from the environment to an internal microphone, comprising:

a flexible noise filter layer of an open cellular material for overlying the sound inlet to reduce the amplitude of audible noise transmitted from the environment to the hearing aid sound inlet;

said noise filter layer having extended top and bottom surfaces of greater area than the cross-sectional area of the sound inlet to form a central area region for directly overlying the sound inlet and a circumferential perimeter region for extending outward of the sound inlet;

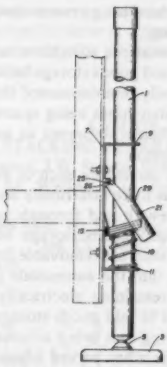
a flexible wind and dust screen layer of tightly woven fabric coextensive with and engaging the top surface of the noise filter layer;

a stretchable bottom ring layer of sheet material having a central aperture of a cross-sectional area greater than the cross-sectional area of the sound inlet engaging the perimeter region of the bottom surface of the noise filter layer;

said screen layer and said stretchable ring layer being permanently secured to the perimeter regions of the respective top and bottom surfaces of the noise filter layer by rings of adhesive with the central area regions of the noise filter surfaces being free of adhesive;

said ring layer having a bottom surface with a coating of pressure sensitive adhesive thereon to enable the attachment to be releasably mounted to the hearing aid housing over the sound inlet.

4,073,367
LEVEL SUPPORT GUARD
Allen C. Wright, Moraga, Calif., assignor to Utility Products, Inc., Oakland, Calif.
Filed Sept. 30, 1976, Ser. No. 728,308
Int. Cl.[2] E06C *7/44*
U.S. Cl. 182—204 1 Claim



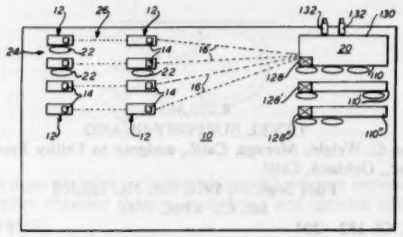
1. A leveler for a ladder or the like comprising a leg extension terminating at one end in a foot, a clutch assembly slidably mounted on said leg extension in normally clutching engagement therewith, means for manually releasing said clutch assembly from such clutching engagement with said leg extention to enable sliding adjustment of said clutch assembly with respect to said leg extension, means for attaching said clutch assembly to a side rail of a ladder, and means protecting said clutch assembly from accidental downward impact capable of releasing said clutch assembly from such clutch engagement with said leg extension, said clutch assembly including a bracket slidably mounted on said leg extension, said bracket comprising a mounting plate having a lateral wing on each end, said wings having aligned holes to receive said leg extension, at least one clutch plate anchored along an edge of said mounting plate and having a hole therethrough to loosely receive said leg extension, resiliant means exerting a lifting force against said plate to normally cause said plate to bite into said leg extension to preclude movement of said leg extension in one direction relative to said clutch assembly, said manual means for releasing said clutch assembly from such engagement with said leg extension comprising an exposed end of said clutch plate and one of said wings to enable one to apply a force to said clutch plate in opposition to said resiliant means, and said protecting means comprising a shroud loosely secured at one end to said mounting plate at a location substantially above the exposed end of said clutch plate and extending beyond said end at a rather steep angle to protect said clutch plate against accidental vertical impact forces sufficient to release said clutch plate and permit relative movement between said clutch assembly and said leg extensions.

4,073,368

AUTOMATED MERCHANDISING SYSTEM

Andrew James Mustapick, 190 Highland Ave., Northport, N.Y. 11768

Continuation of Ser. No. 542,225, Jan. 20, 1975, abandoned. This application July 12, 1976, Ser. No. 704,449
Int. Cl.[2] E04H 3/04
U.S. Cl. 186—1 C 8 Claims



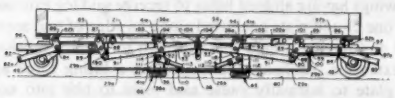
1. An automated merchandising system comprising:
a goods storage building;
a plurality of communications stanchions arranged outside of and remote from said goods storage building but electrically and electronically interconnected therewith;
said communications stanchions being spaced one from the other a distance sufficient to permit an automobile to be parked adjacent thereto;
a goods ordering unit carried by each of said communications stanchions so as to be electrically and electronically interconnected therewith and through said communications stanchion to said goods storage building wherein said goods ordering units are removable from their respective stanchions and into the automobile parked adjacent thereto while still remaining electrically and electronically interconnected to said goods storage building; and
each said goods ordering unit being accessable to an occupant of an automobile when parked adjacent said communications stanchion and being provided with video display means operable by the customer to display goods available at said goods storage building and data transmission means to transmit to said goods storage building data indicative of goods which the automobile occupant desires to obtain.

4,073,369

BRAKE AND TIE-DOWN MECHANISM

Robert A. Nordskog, Tarzana, Calif., assignor to Nordskog Company Inc., Van Nuys, Calif.

Filed Jan. 14, 1977, Ser. No. 759,407
Int. Cl.[2] B60T 1/14
U.S. Cl. 188—5 10 Claims



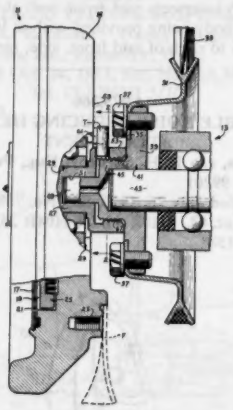
1. A brake and tie-down mechanism for a cart movable on a support surface comprising:
separate support means secured to the bottom of said cart and spaced apart transversely of said cart;
a tie-down mechanism comprising a pair of tie-down locks pivotally mounted at opposite ends on said support means and spaced apart longitudinally of said cart to form a tie down space therebetween;
said space receiving and retaining a tie-down mushroom rigidly secured to said surface in order to restrain the movement of said cart;
brake means mounted on each of said support means comprising brake shoes selectively movable into engagements with said support surface to brake the movement of said cart;
first lever means for moving said brake shoes into engagement with said surface;
second lever means independent of said first lever means for moving said brake shoes away from said surface and simultaneously releasing said mushroom from said tie-down locks;
said second lever means comprising two separate linkages, each linkage being actuated from a different end of said cart to pivot a different one of said locks to release said mushroom, said brake shoes being moved away from said surface by actuation of either of said linkages to move one of said locks;
said first lever means being actuated from either end of said cart for moving said brake shoes into engaging position.

4,073,370

VISCOUS FAN DRIVE ASSEMBLY ARRANGEMENT

Thomas H. Tinholt, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 3, 1976, Ser. No. 738,196
Int. Cl.[2] F16D 35/00
U.S. Cl. 192—58 B 7 Claims

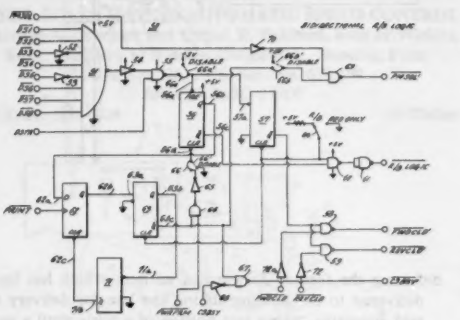


1. A fluid coupling adapted to be mounted on a hub defining a first set of threads, said fluid coupling comprising:
(a) a first rotatable member defining a fluid chamber;
(b) a second rotatable member disposed within said fluid chamber;
(c) said fluid chamber including a volume of fluid for transmitting torque from one of said first and second members to the other of said first and second members in response to relative rotation therebetween;
(d) said second rotatable member including an input shaft and a boss portion defining a second set of threads adapted to be in threaded engagement with the first set of threads defined by the hub;
(e) said boss portion defining a generally radially-extending aperture adapted to receive a connecting member therein; and
(f) said first rotatable member including means defining a slot capable of being positioned radially outward from said aperture and adjacent thereto, said slot-defining means being adapted to receive said connecting member therein when said connecting member is received in said aperture to transmit a rotary motion of said first rotatable member into a rotary motion of said boss portion to selectively effect threaded engagement and disengagement of said boss portion and the threaded hub.

4,073,371
APPARATUS AND CIRCUITS FOR TWO-COLOR PRINTING IN ELECTRONIC IMPACT PRINTERS

Jay Prager, Hudson, N.H., assignor to Centronics Data Computer Corporation, Hudson, N.H.

Filed Nov. 14, 1975, Ser. No. 631,936
Int. Cl.[2] B41J *33/56*
U.S. Cl. 197—157 14 Claims



1. Apparatus for providing two-color printing in an impact printer having platen means for supporting a paper document, a print head assembly and carriage means including means for moving the carriage means and print head assembly across the paper document, said print head assembly including a plurality of print wires and means for selectively activating the print wires to impact said paper document, and means responsive to carriage movement for enabling said activating means, said apparatus comprising:

an elongated inked ribbon extending across the paper document and having first and second colored portions;

means movable between first and second positions for selectively positioning each of said first and second colored portions respectively adjacent said print wires responsive to the receipt of respective first and second signals;

decoder means responsive to a color selection code for generating a ribbon setting signal prior to the printing of each line of characters and/or symbols to select the color in which that line is printed and means for retaining the ribbon setting signal until the line is printed; and

means responsive to completion of the printing of a first group of characters on a line in a first color for operating said carriage moving means to cause the carriage moving means to move the carriage means to a position in readiness for printing additional characters in a second color and to then move the carriage means to begin printing in said second color on the same line;

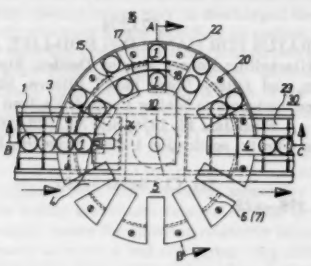
means responsive to said decoder means for delaying the operation of said carriage moving means for beginning a printing operation, until the selected one of said first and second colored portions is stably positioned between said print wires and said paper document whereby said delaying means assures printing of additional characters on the same line will occur in the proper color.

4,073,372
APPARATUS FOR TRANSPORTING CONTAINERS TO AND FROM A WORKING STATION

Hans List, Lau-Strasse 51, 7 Stuttgart 70, Germany

Filed Dec. 22, 1976, Ser. No. 756,338
Claims priority, application Germany, Dec. 27, 1975, 2558886
Int. Cl.[2] B23Q *7/16*
U.S. Cl. 198—341 12 Claims

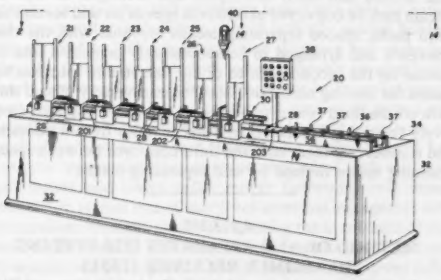
1. Apparatus for transporting containers to and from a working station comprising intermittently rotatable transport disc means provided with a plurality of cutouts extending from the periphery of the transporting disc means into the latter and dimensioned to each receive at least two containers with clearance to space the containers in the direction of the cutout from each other; means for feeding the containers into said cutouts; means spaced from said feeding means in circumferential direction of said transporting disc means for discharging said containers from said cutouts; a working station between said feeding means and said discharging means; and guide means for moving the containers in each cutout during their movement from said feeding means to said working station away from each other to space the same at a predetermined distance from each other as necessary for the operation to be performed at the working station.



4,073,373
LAMINATE STACKING APPARATUS AND METHOD

Norman R. Crowley, 2 W. Sunrise Drive, Evansville, Ind. 47710, and Charles M. Walker, P.O. Box 3436, Evansville, Ind. 47733

Filed Mar. 26, 1976, Ser. No. 670,739
Int. Cl.[2] B65G *57/00*
U.S. Cl. 198—421 40 Claims



37. Apparatus for making a stack having a predetermined height from a plurality of individual plates, the apparatus comprising:

at least one plate dispensing station means;

transporting means for transporting plates from said dispensing station means; and

wherein said plate dispensing station means comprises a magazine for storing a vertical stack of plurality of individual plates, means for dispensing said plates from the bottom of the stack onto said transporting means, and means for positively downwardly urging the plates for feeding the plates to said dispensing means, said plate urging means comprising a pair of pivotable arms for engaging the stack of plates at opposite sides thereof, and a pair of piston means for pivotably moving corresponding ones of said arms into and out of engagement with said plates and wherein each said arm is mounted for pivotal movement in a vertical plane and is comprised of an angular member connected at one end to said piston means and extending substantially horizontal therefrom, said member having a central vertex, and having a roughened edge at

the other end thereof for frictionally engaging the plates, and wherein said plate urging means further comprises a resiliently and substantially vertically mounted support slide to which said vertex of said angular member is connected, and means for slidably mounting said slide.

4,073,374

APPARATUS FOR HANDLING ROD-LIKE ARTICLES

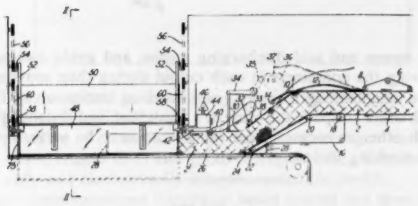
Dennis Hinchcliffe; Robert Thomas Daisley; Stanley Bernard Harper, and Hilary Mark How'l Kilborn, all of London, England, assignors to Molins Limited, England

Filed Jan. 14, 1976, Ser. No. 648,926

Claims priority, application United Kingdom, Jan. 23, 1975, 2936/75

Int. Cl.² B65G *57/00*

U.S. Cl. 198—425 **24 Claims**



1. Apparatus for filling and unloading a container with rod-like articles, comprising a first conveyor for moving a stream of said articles along said path, a second conveyor for receiving the stream and for moving it along a second path towards a third path, the second path being inclined to the first path and to the third path, a third conveyor arranged to convey the stream along the third path, drive means for moving said second and third conveyors and arranged so that the stream may be conveyed at different speeds on said second and third paths, spaced separating means movable with the third conveyor and arranged to be successively projected into the stream on the second path to divide the stream into batches, means for moving successive batches transversely of said third path off the third conveyor and into a container and for successively removing batches of rod-like articles from a container and transferring them onto the third conveyor between spaced retaining means defined by said separating means.

4,073,375

METHOD OF AND APPARATUS FOR FEEDING RANDOMLY RECEIVED ITEMS

Charles G. Hart, Sheboygan; John S. Gordon, Kohler, and Richard D. Sorenson, Sheboygan, all of Wis., assignors to Hayssen Manufacturing Company, Sheboygan, Wis.

Filed Feb. 9, 1977, Ser. No. 767,041

Int. Cl.² B65G *47/52*

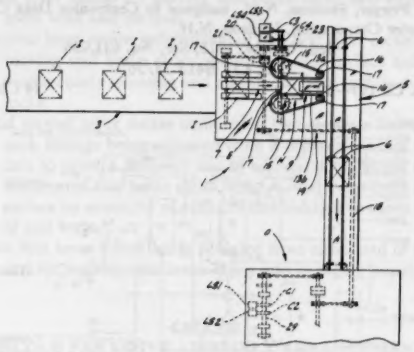
U.S. Cl. 198—466 **13 Claims**

1. The method of feeding items one after another to an apparatus which cycles continuously at a steady rate, referred to as the first rate, with an item being receivable by the apparatus only during a portion of each cycle, items to be fed to the apparatus being randomly delivered one at a time at an average rate, referred to as the second rate, said method comprising the steps of:

feeding the randomly received items one at a time to a holding station where an item may dwell for an interval;

feeding each item which has been delivered to the holding station in time for delivery to said apparatus during said portion of said cycle forward to said apparatus in timed relation with said apparatus for delivery of the item thereto during said portion;

the feeding of a randomly received item to the holding station occurring at a relatively slow speed while the next leading item is at the holding station, and at an accelerated speed when the next leading item is fed forward to said apparatus; and



deferring the feeding forward of an item which has been delivered to the holding station too late for delivery to said apparatus during said portion of a cycle until a next successive cycle.

4,073,376

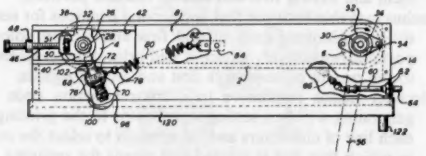
CONVEYOR CLEANING MECHANISM

Robert J. Krooss, 74 Ball Road, Mountain Lakes, N.J. 07046

Continuation of Ser. No. 573,593, April 30, 1975, abandoned. This application Feb. 22, 1977, Ser. No. 770,720

Int. Cl.² B65G *45/00*; B67C *1/08*

U.S. Cl. 198—498 **11 Claims**



1. A conveyor cleaning mechanism positionable against the underside of a conveyor belt:

a horizontally movable cleaning belt of carpet like material adapted to remove undesirable material from the conveyor,

first and second pulleys around which the cleaning belt is positioned,

cleaning means positioned in contact with the cleaning belt,

first biasing means for biasing said cleaning means against said cleaning belt to squeeze the cleaning belt between the cleaning means and a pulley to remove undesirable material from the cleaning belt and,

spray means for applying liquid to the cleaning belt to aid in removing undesirable material from said cleaning belt, said spray means positioned upstream of said cleaning means.

9. A cleaning mechanism adapted to be positioned between two substantially parallel conveyors which conveyors have means provided to cause an item travelling on one conveyor to be transported across the cleaning mechanism onto a second conveyor comprising:

a cleaning belt of carpet like material to remove undesirable material from items travelling on a conveyor,

first and second pulleys around which the cleaning belt is positioned,

cleaning means positioned in contact with the cleaning belt,

first biasing means for biasing said cleaning means against said cleaning belt to squeeze the conveyor belt between

the cleaning means and pulley to remove undesirable material from the cleaning belt and,

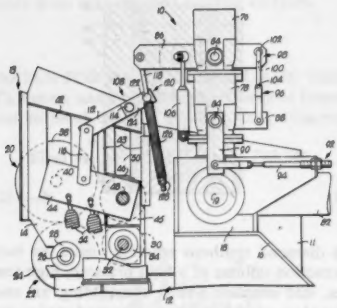
spray means for applying liquid to the cleaning belt to aid in removing undesirable material from said conveyor belt, said spray means positioned upstream of said cleaning means.

4,073,377

FEED ROLLS HAVING AUTOMATIC SPEED CONTROL

Herman V. Stoessel, and Daniel R. Prichard, both of Wichita, Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Apr. 20, 1976, Ser. No. 678,499
Int. Cl.[2] B65G *17/00*
U.S. Cl. 198—624 **28 Claims**



1. In a material processing machine, apparatus including:

a pair of adjacent assemblies having a pair of cooperating, rotatable means for conveying material therebetween, said assemblies being relatively shiftable toward and away from one another;

a power train for rotating said rotatable means;

a regulator associated with said power train for controlling the angular velocity of said rotatable means; and

operating means responsive to relative shifting movement of said assemblies and coupled with said regulator in a manner to change the angular velocity of said rotatable means when said assemblies shift relative to one another,

said regulator including a shiftable control lever coupled with said operating means, the latter means including motion dissipating means for permitting independent operation of said control lever without relatively shifting said assemblies.

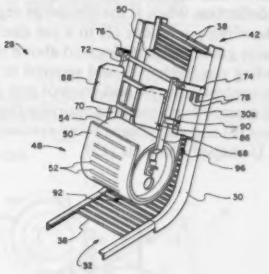
4,073,378

AUTOMATIC TOBACCO HARVESTER WITH IMPROVED LEAF CONVEYING SYSTEM

Bertram Lee Jordan, and John Davis Mitchell, both of Lewiston, N.C., assignors to Harrington Manufacturing Company, Lewiston, N.C.

Filed July 19, 1976, Ser. No. 706,612
Int. Cl.[2] B65G *15/14*
U.S. Cl. 198—627 **3 Claims**

1. In an automatic tobacco harvester of the type having a mobile frame, defoliator means mounted on said mobile frame and carried thereby, and drive means for driving said defoliator means, the improvement comprising a conveyor assembly generally disposed on each side of said defoliator means for receiving leaves defoliated by said defoliator means and conveying said leaves generally rearwardly and upwardly about said harvester where the leaves are discharged therefrom, each conveyor assembly comprising: a conveyor frame structure; a first chain link type conveyor means disposed about said conveyor frame structure and having a generally horizontal conveying section for receiving tobacco leaves and conveying them rearwardly relative to said defoliator means, and a vertical lift section disposed rearwardly of said horizontal conveying sections and having an elevated terminal end; second belt conveyor means disposed adjacent and generally above said vertical lift section of said first chain link type conveyor means and cooperable therewith to convey tobacco leaves therebetween from a lower level relative to said harvester to an upper level where the tobacco leaves may be discharged therefrom; said second belt conveyor means including an endless, flexible and generally slack belt conveyor trained around two independent spaced apart rollers including a lower disposed roller disposed generally adjacent the lower portion of the vertical lift section of said first chain link type conveyor means and an upper roller disposed above and slightly rearwardly of the rear terminal end of said vertical lift section of said first chain link type conveyor means; mounting means movably mounting said lower roller adjacent said first conveyor means for floating back-and-forth bodily movement relative to said first chain link type conveyor means for allowing relatively large masses of tobacco leaves to enter a leaf conveying area defined between the vertical lift section of said first chain link type conveyor means and said second belt conveyor means without clogging or jamming; said mounting means movably mounting said lower roller including a pair of laterally spaced holding arms secured to said conveyor frame structure and extending upwardly therefrom; rock shaft means rotatably secured transversely between said holding arms, a pair of laterally spaced pivot arms secured at one end to said rock shaft means and extending therefrom where the other end of said pivot arms are rotatively connected to said lower roller of said second belt conveyor means such that as pivot arms pivot with said rock shaft means said lower roller moves therewith; stop means mounted on at least one of said pivot arms and engageable with the conveyor frame structure for limiting the movement of said lower roller towards said first conveyor means; a pair of laterally spaced belt guide plates disposed adjacent said lower roller of said second belt conveyor means for guiding said belt conveyor about said lower roller of said second belt conveyor means, each of said guide plates being secured to a respective pivot arm intermediately between said lower roller of said second belt conveyor means and said rock shaft means and extending upwardly therefrom.



4,073,379

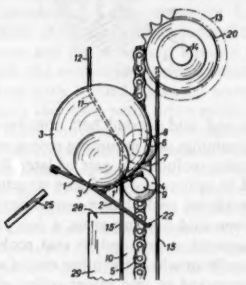
BOWLING PIN ELEVATOR FOR A BOWLING INSTALLATION

August Schmid, Schwerzenbach, Switzerland, assignor to Patentverwertungs und Finanzierungsgesellschaft, Serania AG, Glarus, Switzerland

Continuation-in-part of Ser. No. 589,267, June 23, 1975, abandoned. This application Sept. 30, 1976, Ser. No. 728,159
Claims priority, application Switzerland, June 27, 1974, 8827/74
Int. Cl.[2] A63D *5/00*
U.S. Cl. 198—796 **10 Claims**

1. Bowling pin elevator in a bowling pin installation, having bowling pin transport means to transport bowling pins to a discharge region, comprising

two, each, upper and lower guide wheels (13, 40'), at least one of the guide wheels comprising a sprocket wheel (13);
two spaced upwardly extending endless chains (5) looped over the guide wheels (13, 40'), the guide wheels guiding the chains for endless travel and reversal;
a plurality of elongated bowling pin holders (1) attached to the endless chains (5), the chains moving the holders to the discharge region for the pins (1), said discharge region being located between the upper guide wheels (13);
means (9, 21) pivotably supporting the pin holders (1) on the chains (5);
at least one position control arm (7) fixedly secured to the pin holders (1) to control the pivotal position thereof;
guide track means (10) comprising upwardly directed generally U-shaped channels (15) guiding said pin holder position control arm (7) for holding the arm and hence the bowling pin holder (1) of the bowling pin transport means in a first pin supporting position when the holder is below the discharge region, said channels (15) retaining said chains (5) and being formed at the discharge region with a deflecting surface (11) extending away from the major direction of the channels (15) to guide the arm (7) for pivotal deflection when at the discharge region, and hence tip the bowling pin holder (1) to a pin discharge position;
a control arm guide roller (6) located above the pivot axis of the bowling pin holder (1) and secured to the pin holder position control arm (7), said control arm guide roller (6) and said means (9) pivotally supporting the pin holders on the chains (5) and said chains being retained in and guided by said U-shaped channels (15);



the channels (15), at the discharge region, having a width which is enlarged with respect to the remainder thereof to guide the control arm guide roller (6) away from the path of the chain and hence pivot the pin holder secured thereto, to pivotally deflect the pin holder and release a pin (3) supported by the pin holder,
the enlarged width extending in a direction away from the return run of the chains (5) looped about the upper guide wheel (13), the arm (7) extending upwardly in the region of transport of pin holders (1) below the discharge position from the pivot axis (48) of the pin holder (1);
and centering means (28, 29) fixedly located adjacent the track means (10, 15) below the upper guide wheels (13), extending in a direction towards the center of the pin holders (1) to move a bowling pin (3) located on a respective holder (1) to a predetermined position, so that the pins (3) being discharged from the respective holders at the discharge position will have a predetermined position with respect to the track means (10, 15),
the centering means comprising two centering structures (28) formed with converging surfaces (29) directed towards each other and, in the direction of movement of the pin holders (1), being inclined towards the center of the pin holder, the minimum distance of the inclined surfaces being slightly greater than the length of a pin (3) with which the elevator is to be used;
and clearance slots (30) formed in the pin holders and slightly greater than the wides dimension of the centering structures (28) to provide for passage of the pin holders (1) past the centering structures with clearance.

4,073,380

HIGH PRESSURE REACTION VESSEL FOR QUALITY CONTROL OF DIAMOND GROWTH ON DIAMOND SEED

Herbert M. Strong, Schenectady, and Roy E. Tuft, Guilderland Center, both of N.Y., assignors to General Electric Company, Worthington, Ohio

Division of Ser. No. 412,425, Nov. 2, 1973, Pat. No. 4,034,066.
This application July 15, 1976, Ser. No. 705,720
Int. Cl.[2] C01B *31/06*; B65D *25/08, 85/70*
U.S. Cl. 206—219 **4 Claims**

1. In a diamond synthesis reaction vessel for introduction into the reaction volume of a high pressure, high temperature apparatus, said reaction vessel constituting an assembly of interfitting elements for enclosing diamond seed material and a source of substantially pure carbon, said diamond seed material and source of carbon being separated by a mass of metallic catalyst-solvent material for the diamond-making reaction disposed therebetween so as to provide a predetermined temperature gradient between said diamond seed material and said source of carbon under operating conditions of pressure and temperature in the diamond stable region of the phase diagram of carbon, said diamond seed material and said source of carbon being located in separate regions of said reaction vessel such that under said operating conditions said diamond seed material will be heated to a temperature near the minimum value of temperature for said temperature gradient and simultaneously said source of carbon will be heated to a temperature near the maximum value of temperature for said temperature gradient, the combination with said interfitting elements of
a. a layer of metallic isolating material disposed in contact with the diamond seed material and between said diamond seed material and the mass of catalyst-solvent material, said isolating material being unpierced where contact is made with said diamond seed material and being selected from the group consisting of platinum, molybdenum, titanium, tantalum, tungsten, iridium, osmium, rhodium, palladium, vanadium, ruthenium, chromium, hafnium, rhenium, niobium and zirconium and alloys thereof and in any given reaction vessel construction said isolating material having a melting point, when in contact with diamond, that is higher than the melting point of the metallic catalyst-solvent material saturated with carbon dissolved therein when in contact with diamond.

4,073,381

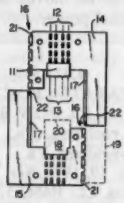
COMPONENT CARRYING

William Luther Patterson, Northboro, Mass., assignor to Adams-Russell Co., Inc., Waltham, Mass.

Filed Aug. 22, 1975, Ser. No. 607,034
Int. Cl.[2] B65D *73/02*
U.S. Cl. 206—331 **10 Claims**

1. Component carrying apparatus comprising,
means defining a thin member of thickness between opposed exterior surfaces much less than its length or width for

accommodating lead channels in which component leads may be inserted for protection and including means defining said lead channels,



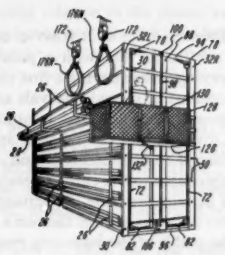
said lead channels being defined by a series of partially overlapping recesses extending into the interior of said member from said opposed exterior surfaces.

4,073,382

APPARATUS FOR RACKING STEEL AND THE LIKE

Thomas D. Fahey, and Samuel Schlagel, both of Denver, Colo., assignors to Steel Storage Systems, Inc., Commerce City, Colo.

Filed Jan. 28, 1977, Ser. No. 763,249
Int. Cl.² A47F 5/00
U.S. Cl. 211—1 **15 Claims**



1. The apparatus for racking steel and the like which comprises: a first two sided rack having a front end with spaced parallel rail-forming uprights defining a vertical track, a plurality of openable open topped drawer-like receptacles arranged one above the other in tiered relation on at least one side thereof, and means accessible at the front end on the side thereof having said receptacles for independently actuating the latter between open and closed positions; elevator means including a cage-carrying frame secured to said rail-forming uprights for vertical movement along the track defined thereby, and a fence enclosed platform defining an operator's cage-carrying frame for vertical movement therewith and for independent transverse movement in relation thereto from a centered position in front of the rack to at least one offset position shifted to the side of center; and, hoist means operatively connected to the cage-carrying frame for raising and lowering the elevator means.

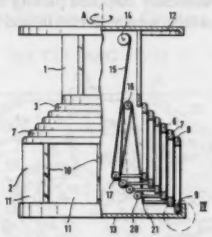
4,073,383

DEVICE FOR DISPLAYING CARPET PATTERNS OR THE LIKE

Jürgen Rümmer, Industriestr. 12, 8602 Troisdorf, Germany

Filed Feb. 18, 1976, Ser. No. 659,007
Int. Cl.² A47F 3/11
U.S. Cl. 211—1.5 **7 Claims**

1. A columnar device rotatable about a vertical axis in both directions of rotation for the display of samples of carpets or the like comprising a plurality of cylindrical rings with an upper fixed ring and a lower fixed ring and shiftable rings between said upper and lower rings for carrying carpet patterns on their peripheral parts and arranged with a stepped increase in diameter coaxially between said axially fixed upper ring with the smallest diameter and an said axially fixed lower ring with the largest diameter, and lifting means for selectively raising and lowering the shiftable cylindrical rings carrying



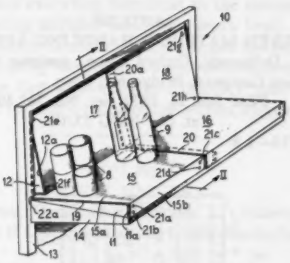
said carpet patterns in an axial direction, said device having a fixed height between said fixed upper ring and said fixed lower ring, said height being substantially less than the sum of individual heights of said cylindrical rings.

4,073,384

SHELF PROTECTOR

Lawrence S. Celeste, 1561 Birch, Hanover Park, Ill. 60103

Filed May 6, 1976, Ser. No. 683,837
Int. Cl.² A47F 5/00
U.S. Cl. 211—134 **6 Claims**



1. A protected shelf assembly comprising in combination:

a. a shelf securely installed on a supporting means and a shelf back secured at approximately right angles to said shelf at an interior edge adjacent said supporting means;

b. a removable shelf protector having a sheet-like main surface portion and a lip, the main surface portion being positioned on a surface of said shelf and the lip portion abutting an outer edge of said shelf remote from said supporting means;

c. a sheet-like shelf back protector having a main surface portion which is positioned against a surface of said shelf back;

d. said shelf back and shelf having wedge-shaped display surfaces and said shelf protector is of a complementary wedge shape; and

e. a plurality of said shelf protectors and shelf back protectors being provided so that at least two adjacent protectors overlap along side edges thereof.

4,073,385

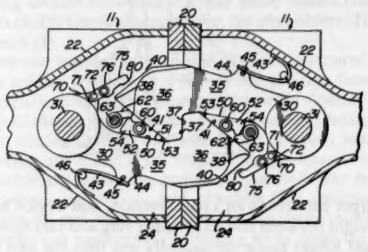
CAR COUPLER

Robert T. Reed, Moorestown, N.J., assignor to Walton Products, Inc., Broomall, Pa.

Filed Jan. 13, 1977, Ser. No. 758,944
Int. Cl.² B61G 3/04
U.S. Cl. 213—100 R **6 Claims**

1. In apparatus for controlling the coupling and uncoupling

of railway vehicles for each of the vehicles to be coupled including a housing at an end of the vehicle to be coupled to another vehicle, said housing having a resiliently biased coupler hook carried therein having a position for coupling engagement and an out of engagement position, said coupler hook having a vertically disposed pulling face and a vertically disposed control face, a cam carried in said housing engageable



with said control face for moving said coupler hook to an out of engagement position, a pawl in engagement with said cam for actuating said cam, and means for moving said pawl for operating said cam, the improvement which comprises

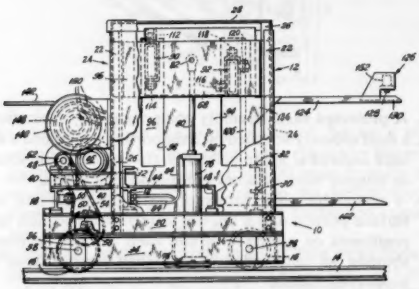
means engaged with a portion of said coupler hook and movable thereby into engagement with another coupler hook positively holding said last mentioned coupler hook in coupled engagement.

4,073,386

POWERED MATERIAL HANDLING APPARATUS

George L. DeNomme, Oxford, Conn., assignor to The Chapin and Bangs Company, Bridgeport, Conn.

Filed Jan. 24, 1977, Ser. No. 762,102
Int. Cl.² B65G *35/00*
U.S. Cl. 214—1 F **13 Claims**



1. Powered material handling apparatus comprising, in combination:

(a) a carriage constituted as a frame construction having a pair of spaced-apart trucks provided with wheels to enable the trucks to travel in parallel directions while secured to the frame construction,

(b) said frame construction including cross members rigidly connecting the trucks together,

(c) a pair of cross beams extending between the trucks,

(d) each truck having a cross-head to which the ends of the cross beams are secured,

(e) vertical guides on the trucks, engaged by the cross-heads and enabling the latter to have raising and lowering movement on the trucks,

(f) power means carried by the trucks, connected to said cross-heads for effecting the raising and lowering movement thereof,

(g) fork structures carried by said cross beams, including tines extending laterally away from the beams for supporting sheared plate sections, and

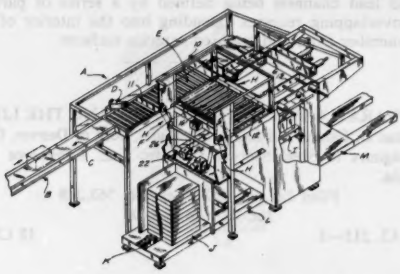
(h) anti-friction means carried by the fork structures, enabling the same to be moved along the lengths of the beams under manual power.

4,073,387

METHOD AND APPARATUS FOR TIER FORMING ON A ROW BY ROW BASIS

Robert E. Bowser, Lynchburg, Va., assignor to Simplimatic Engineering Co., Lynchburg, Va.

Filed Dec. 19, 1975, Ser. No. 642,576
Int. Cl.² B65G *57/26*
U.S. Cl. 214—6 P **27 Claims**



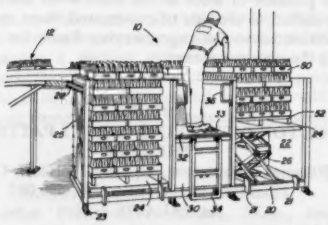
1. Means for forming a tier of R rows of cartons, each row having a given width, for use with a palletizer or the like comprising conveying means having a first side at which rows of cartons are received at spaced intervals and a second side, said conveying means, when actuated, transporting the rows of cartons thereon towards said second side, and means responsive to the number of rows present on said conveying means and effective, subsequent to the entry of each of the incoming rows of cartons at said first side, to actuate said conveying means to transport the rows present thereon a distance substantially equal to the width of the incoming row, when less than R rows are present on the conveying means, and a selected distance sufficient to move the leading row on said conveying means to said second side thereof, when R rows are present thereon.

4,073,388

SEMI-AUTOMATIC LIFTING SYSTEM

Norman R. Carter, Bossier City, La., assignor to Zetco Manufacturing Company, Incorporated, Shreveport, La.

Filed Jan. 6, 1977, Ser. No. 760,133
Int. Cl.² B65G *59/02*
U.S. Cl. 214—8.5 A **5 Claims**



1. In an apparatus for reducing manual handling and lifting of cases which are to be stacked onto and unstacked from pallets by an operator, the apparatus including at least one conveyor on which the cases are movable, the improvement comprising:

a box-like support frame open along at least one vertical face thereof, the conveyor being disposed along the opposite face thereof and adjacent to the support frame, the upper surface portions of the conveyor being disposed slightly below the upper surfaces of the frame;

first station means mounted centrally of the support frame for supporting the operator;

at least one case-receiving station means carried on one end of the frame adjacent the first station means and including a planar support member for receiving one of the pallets thereon, the planar support member being accessible through the open vertical face of the frame;

vertically extensible means disposed in the case-receiving station means for supporting and vertically displacing the planar support member; and,

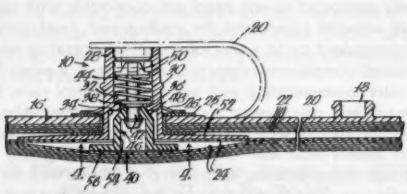
control means disposed on the first station means and operable by the operator for actuating the vertically extensible means, the planar support member being thus positionable to cause at least the uppermost cases stacked on the pallet located on said planar support member to be disposed immediately above the upper surfaces of the frame, whereby the operator can manually displace the cases substantially horizontally toward and into surmounting relation to the conveyor to thereby position the cases on the conveyor, cases already on the conveyor being substationally horizontally displaceable by the operator to positions within the case-receiving station means for receipt into surmounting relation to the planar support member, lifting of the cases on movement to and from the conveyor being minimized.

4,073,389

DUNNAGE BAG FILL VALVE DEVICE WITH INTEGRAL COMBINATION BAFFLE, PLUG-RETAINER, AND BLADDER SEPARATOR

Barry R. Angarola, Schaumburg, Ill., and James A. Robbins, Covington, Tenn., assignors to Signode Corporation, Glenview, Ill.

Filed Nov. 11, 1976, Ser. No. 740,951
Int. Cl.² B60P 7/14
U.S. Cl. 214—10.5 D **11 Claims**



1. In an inflatable dunnage bag having a relatively thin-film, flexible, airtight bladder, the improvement comprising:

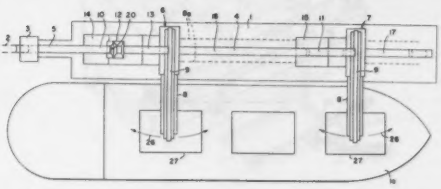
a fill valve device mounted in said bag and extending from the exterior of the bag to the interior of said bladder, said bladder being inflatable with a gas through the fill valve device, said fill valve device having a hollow housing and a plug member disposed therein, said housing having on one end a mounting flange secured to said bladder, the interior surface of said housing defining an orifice, said plug member having a seating surface adapted to seal against said orifice, said plug member further having an extension member projecting from said one end of said housing into said bladder beyond said mounting flange, said extension member having on the distal end a baffle cross wall spaced from, and partially overlapping, said mounting flange whereby, when said bag is being inflated, said baffle cross wall deflects the gas to prevent impingement upon the bladder wall opposite said one end of said housing.

4,073,390

SHIP LOADING SYSTEM

Hendrik Cornelis van Cappelle, Bentveld, Netherlands, assignor to Hoogovens Ijmuiden, BV, Ijmuiden, Netherlands

Filed Nov. 15, 1976, Ser. No. 741,984
Claims priority, application United Kingdom, Aug. 17, 1976, 34269/76
Int. Cl.² B65G 67/58
U.S. Cl. 214—14 **11 Claims**



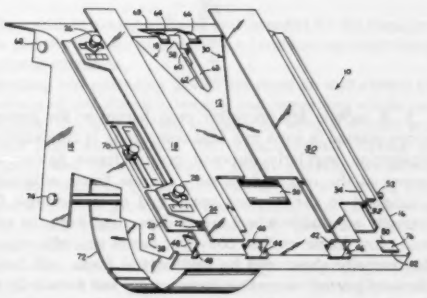
11. In a ship loading system for bulk cargo, having at least two shiploaders for continuous conveyance of the cargo onto the ship and a conveyor system for delivery to the shiploaders, the improvement that the shiploaders are both shiftable along the ship's berth, and the conveyor system comprises an endless main conveyor extending along the ship's berth and having a first tripper at its delivery point to the first shiploader and a second tripper at its delivery point to the second shiploader, a first portion of the conveyor extending to the first tripper and a second portion extending therefrom to the second tripper, the trippers being shiftable along the ship's berth with the respective shiploaders, and at the first tripper the flow on the main conveyor being switchable without interruption between delivery to the first shiploader and delivery onto the said second portion for conveyance to the second tripper.

4,073,391

SHEET JOGGER

John G. O'Brien, Darien, and Franklin J. Calderazzo, New Canaan, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Sept. 24, 1976, Ser. No. 726,108
Int. Cl.² B65H 31/34, 33/08
U.S. Cl. 214—65 **18 Claims**



1. Jogging apparatus for bringing a plurality of sheets in a stack into a registered bundle comprising:

A. means having an infeed end and an outfeed end for supporting a plurality of sheets;

B. means adjacent said infeed end of said supporting means for conveying said sheets onto said supporting means;

C. means adjacent said outfeed end of said supporting means for registering the leading edges of said sheets;

D. means for jogging the trailing edges of said sheets into registration against said register means;

E. means for jogging the side edges of said sheets into registration;

F. means for discharging said registered bundle of sheets from said outfeed end of said support means, and;

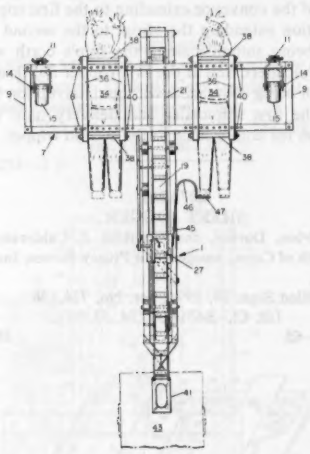
G. unitary cylindrical control means having radial and axial control surfaces, said control means being located below said supporting means for controlling said lead edge register means, said trailing edge jogging means, said side edge jogging means, and said discharging means.

4,073,392

MOBILE SELF-PROPELLED HARVESTER

Carson E. Dibler, Colorado Springs, Colo; Owen O. Cowan, 2420-4th Ave., Pueblo, Colo. 81003; Ruth R. McDonald, 2520-4th Ave., Pueblo, Colo. 81003, Successor of said Carson E. Dibler, deceased

Filed Oct. 18, 1976, Ser. No. 733,160
Int. Cl.[2] B60P *3/14*
U.S. Cl. 214—83.1 **5 Claims**



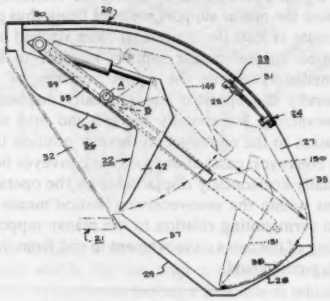
1. A mobile self-propelled crop harvester for harvesting crops planted in rows in a field comprising in combination, an elongation angularly disposed central frame having wheel means at the rear end thereof, a cross frame adjacent and connected to the forward upper end of said central frame, laterally adjustable wheel means depending from the ends of said cross frame, endless conveyor means spacedly supported horizontally above and by said central frame and having a forward portion extending downwardly and forwardly therefrom, power source means arranged on said central frame and drivingly connected to said conveyor and rear wheel means, vertically adjustable bracket means depending from said cross frame on opposite sides of said central frame, and horizontal rigid cradle means carried by said bracket means and contoured and shaped to correspond with a human body torso and legs for supporting a pair of workers in reclining forwardly extending face down positions adjacent the forward end of said conveyor means, said cradle means being formed with neck receiving recesses and diverging supporting portions whereby crops picked by said workers are disposed on said downwardly and forwardly extending conveyor and delivered rearwardly of said harvester, and throttle control means associated with one of said leg supporting portions for operation by one worker to control the actuation of said power source means.

4,073,393

CONTROL SYSTEM FOR REFUSE PACKER ASSEMBLY

Roland W. McKenzie, and Richard Stansberry, both of Culpeper, Va., assignors to City Tank Corporation, Culpeper, Va.

Continuation of Ser. No. 754,071, Dec. 22, 1976, abandoned, which is a continuation of Ser. No. 629,701, Nov. 6, 1975, abandoned. This application Apr. 22, 1977, Ser. No. 790,141
Int. Cl.[2] B65F *3/00*
U.S. Cl. 214—83.3 **20 Claims**

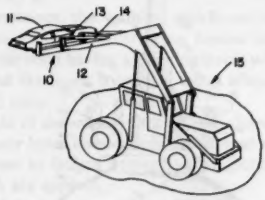


1. In a refuse collection vehicle provided with a mechanism mounted on a refuse receiving hopper thereof for transferring refuse deposited in said hopper into a storage body and compacting the refuse therein, said mechanism including a panel engageable with refuse deposited in said refuse receiving hopper, a first fluid actuated component operatively connected to said panel and a second fluid actuated component operatively connected to said panel and cooperable with said first fluid actuated component for cycling said panel through a predetermined cycle, a control system for operating said fluid actuated components comprising a fluid tank; a pump having an inlet communicating with said tank; a control valve having a main fluid passageway therethrough communicating at an inlet port thereof with the outlet of said pump and at an outlet port thereof with said tank, a pilot fluid passageway therethrough communicating at an inlet port thereof with the outlet of said pump and at an outlet port thereof with said tank, a first valve spool selectively operable for communicating the inlet port of said main fluid passageway with said first fluid actuated component, said first spool being displaceable between a first position obstructing said pilot fluid passageway and a second position not obstructing said pilot fluid passageway, said first valve spool having a surface disposed at an angle relative to a longitudinal axis thereof communicating with said pilot fluid passageway, and a second valve spool selectively operable for communicating the inlet port of said main fluid passageway with said second fluid actuated component, said second valve spool being displaceable between a first position obstructing said pilot fluid passageway at a point thereof between the point of obstruction of said first valve spool and the outlet port of said pilot fluid passageway, and a second position not obstructing said pilot fluid passageway said second valve spool having a surface disposed at an angle relative to a longitudinal axis thereof communicating with said pilot fluid passageway; and a means for shifting said first and second valve spools to said first positions thereof.

4,073,394
LIFT TRUCK WITH ATTACHMENT FOR CARRYING AUTOMOBILES

Benjamin F. Biaggini, and Paul V. Garin, both of San Francisco, Calif., assignors to Southern Pacific Transportation Company, San Francisco, Calif.

Filed Jan. 6, 1976, Ser. No. 646,941
Int. Cl.² G02F 3/81
U.S. Cl. 214—145 R **4 Claims**



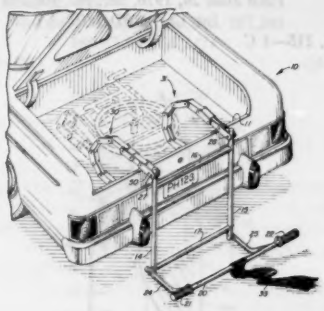
1. Apparatus for transporting automobiles comprising:
a. a lift truck having lift arms,
b. an elongated carriage mounted on said lift truck arms for elevation thereby,
c. first and second sets of elongated horizontal tines extending forwardly of said carriage, each set comprising two parallel tines,
d. means mounting said tines on said carriage for horizontal movement of said tines along said carriage,
e. means for fixing the centers of said tine sets relative to said carriage and including a first control therefor for moving the centers of the two sets of tines simultaneously along said carriage in equal and opposite directions from the center of said carriage and a second control for moving the centers of the two sets of tines simultaneously along said carriage in the same direction with a constant spacing between the centers of said sets of tines, said first and second controls being operable independently of each other,
f. means including a third control therefor for moving both of the two tines of each set towards the center of the set and for moving both of them away from the center of the set while the centers of said sets are fixed relative to said carriage, said third control being operable independently of said first and second controls.

4,073,395
TRUNK LOADING APPARATUS

Clyde H. Clement, 8439 N. 13th Place, Phoenix, Ariz. 85020

Filed Feb. 7, 1977, Ser. No. 765,943
Int. Cl.² B60R 9/00
U.S. Cl. 214—450 **10 Claims**

1. An automobile trunk loading apparatus including in combination:
frame means having first and second ends for supporting an object to be loaded into an automobile trunk;
at least one chain-like linkage means extendible to a substantially straight line configuration and comprised of a plurality of pivotally attached interconnected links including mutual engaging portions to limit the minimum radius of curvature attainable by said linkage means to a predetermined amount;
means pivotally attaching one end of said linkage means to a first end of said frame means; and
means for attaching the other end of said means adjacent the linkage interior of the trunk opening near the rear edge thereof to permit said linkage means to extend therefrom and lie on the bottom of the trunk to cause the first end of said frame means to be located in the interior of the trunk remote from the rear edge thereof and to cause the second end of said frame means to be located near the rear edge

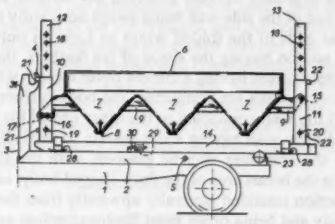


of the trunk when said apparatus is in the trunk in the loaded position.

4,073,396
MOVABLE CONTAINER ADJUSTABLE IN HEIGHT, FOR LOADING ON A VEHICLE

Christian Derain, Saint-Aubin-Le Vieil Evreux Eure, France, assignor to Societe Nouvelle des Bennes Saphem, La Neuve-Lyre, France

Filed Apr. 20, 1977, Ser. No. 789,314
Claims priority, application France, Apr. 21, 1976, 76 11760
Int. Cl.² B60P 1/54
U.S. Cl. 214—515 **10 Claims**



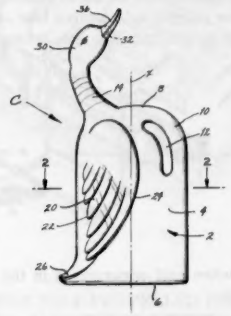
1. In a vehicle having a chassis and intended for the transportation and distribution of materials, a combination comprising:
a chassis extension,
a loading and unloading device mounted on said chassis by means of said chassis extension, and comprising a hoist and a jack, the hoist having at least one vertical branch and one horizontal branch, the vertical branch having an upper end provided with a hook, and the horizontal branch being mounted pivotably around a pivoting axle parallel to the ground and transverse to said chassis so as to be able to cause the hoist to pivot under the effect of said jack; and
a movable container adjustable in height comprising a cradle provided at the front and at the rear with vertical posts, sliders in engaging relationship with said posts and each having at least one hooking member to cooperate with said hook of the upper end of the vertical branch of said hoist, immobilizing means for temporarily immobilizing in a desired position said sliders with respect to said vertical posts, a bridge comprising at least one longitudinal beam and a receptacle supported by said beam, and means for inclining said bridge, connecting the latter, in proximity to its ends, to the sliders, and enabling the latter to take up an inclined position depending on the relative position of the sliders.

4,073,397

FOWL-SHAPED CONTAINER

Elvin E. Snodgrass, Rte. 2, Wappapello, Mo. 63966

Filed June 28, 1976, Ser. No. 700,586
Int. Cl.[2] B65D *1/02*
U.S. Cl. 215—1 C 7 Claims



1. A container comprising: a generally tubular body having a longitudinal axis and being shaped to generally resemble the body of a duck or similar fowl, the body including a tubular side wall of generally circular configuration that is generally concentric about the longitudinal axis and the sidewall having embossments on opposite sides of it, with the embossments being in the shape of folded wings, the body also including a bottom wall connected to the sidewall and being generally flat and generally squared off with respect to the side wall so that when the container rests on the bottom wall, the side wall will be in a generally upright position, the bottom wall and the lower end of the side wall being swept outwardly intermediate the rear ends of the folded wings to form an outwardly projected section having the shape of tail feathers, the outwardly projected section having a curved outer margin where the side and bottom walls are connected, the body further including a curved top wall connected to the other end of the tubular side wall, the top wall having a slot therein to provide a handle at which the container may be grasped, with the slot being located in the breast area of the duck-shaped body; and a reduced end section extended generally upwardly from the top wall of the body and being offset from the longitudinal axis and away from and opposed to the handle in the breast area of the duck-shaped body so as to be located intermediate the forward ends of the folded wings, the end section including a neck portion which is connected at its one end to the top wall of the body and a head portion which is connected to the other end of the neck portion, the neck portion resembling the neck of a duck and being extended in generally the same direction as the longitudinal axis so as to project upwardly beyond the end of the side wall and within the circumference of the side wall, the head portion resembling the head of a duck, the end section being separable into a spout and a cap with the spout being hollow and opening into the hollow interior of the body, whereby when the cap is removed from the spout, the relative positions of the handle and the spout facilitate the pouring of liquid contents from the container.

4,073,398

SNAP-LOCK DEVICE FOR SECURING A DISPENSING MECHANISM TO A CONTAINER

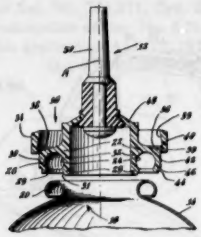
Robert S. Schultz, Old Greenwich, Conn., assignor to The Risdon Manufacturing Company, Naugatuck, Conn.

Filed Jan. 28, 1977, Ser. No. 763,568
Int. Cl.[2] B65D *41/32*
U.S. Cl. 215—253 9 Claims

1. A snap-lock device for securing a dispensing mechanism, such as a pump, valve, or the like, to the mouth of a container which has an annular bead about the mouth periphery; said snap-lock device comprising:

A. a bead embracing ring formed with

1. an axially extending, annular recess which is open at one extreme of its axial extent to receive the bead, said recess being shaped so that said ring tightly embraces the bead when received in said recess; and
2. an annular rib, adjacent the open margin of said recess,



which underlies at least a portion of the bead when received in the recess;

B. retainer means, engageable on said ring when installed on the bead, for exerting a force against said ring in the radial direction to retain said rib in underlying relation to the bead, the dispensing mechanism being mounted with one of said ring and retaining means; and

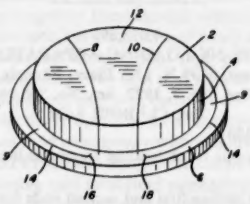
C. means for positively preventing relative disengagement of said ring and retaining means.

4,073,399

TEAR-OFF CLOSURE

Paul R. Lewis, Richmond, Ind., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Feb. 25, 1976, Ser. No. 661,254
Int. Cl.[2] B65D *41/42*
U.S. Cl. 215—254 5 Claims



1. A tear-off closure for a container comprising a top end wall, a depending closure skirt around the top end wall and a pull ring around the bottom edge of said closure skirt, said closure having a pair of score lines therein traversing said skirt and top end wall to define a tear strip across said closure with said pull ring integrally connected to said tear strip at the bottom of said closure skirt, and a line of separation between said pull ring and said closure skirt from a location adjacent said score line on one side of said tear strip around said closure skirt to a location adjacent said score line on the other side of said tear strip, with the terminal ends of said line of separation spaced from said tear strip laterally of said score lines on both sides of said tear strip.

4,073,400

GAS CONTAINERS

Greville Bertram Brook, High Wycombe; William Henry Bowyer, Farnham, and Charles Desmond Desforges, Chalfont-St-Giles, all of England, assignors to Fulmer Research Institute, Stoke Poges, England

Filed Nov. 12, 1975, Ser. No. 631,321

Claims priority, application United Kingdom, Nov. 15, 1974, 49576/74

Int. Cl.[2] B65D *25/14*

U.S. Cl. 220—63 R 5 Claims

1. A gas container, the walls of which are formed of two bonded layers, the outer layer being formed of a fibre-reinforced synthetic resin having a working strain which is greater than 0.1% and the inner layer of a metal alloy, which inner layer of metal alloy:

(a) is capable of deforming elastically to the working strain of the outer layer up to a strain of at least about 2%,

(b) is resistant to fatigue damage when cyclic strains up to about 2% are applied,

(c) has an M_s temperature at least 50° C below the operating temperature of the container, and

(d) is resistant to corrosion by the gas which the container is intended to contain.

4,073,401

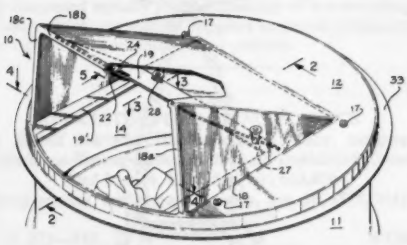
HEAT ACTIVATED FIRE-SAFE COVER ASSEMBLY

Paul L. Pecchenino, Felton, Calif., assignor to Huggins Engineering Company, Santa Clara, Calif.

Filed Oct. 18, 1976, Ser. No. 723,324

Int. Cl.[2] B65D *25/00, 43/24, 55/00*

U.S. Cl. 220—88 R 5 Claims



1. A heat activated fire extinguishing cover assembly for forming an oxygen starved condition within a container comprising a top closure member adapted to extend across the open upper end of the container and form a lid thereto, an unobstructed opening formed through said member for disposing articles into the container, a door and means disposing said door to be movable between open and closed positions relative to said opening, said door when in said open position serving to permit the entry of articles into the container, and when in said closed position serving to sufficiently seal said opening so as to extinguish fire within the container by limiting the supply of oxygen thereto, said top closure member including a hood forming a flue opening disposed above the first named said opening, carried by an edge portion of said flue opening and heat destructible latch means engaging the underside of the forward edge margin of said door for retaining said door in its open position until sufficiently weakened by heat and the weight of the door to release the door to move to close said opening.

4,073,402

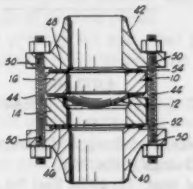
PREASSEMBLED PRESSURE RELIEF APPARATUS

Loren E. Wood, Tulsa, Okla., assignor to Black, Sivalls & Bryson, Inc., Houston, Tex.

Filed July 21, 1976, Ser. No. 707,249

Int. Cl.[2] F17B *1/14*

U.S. Cl. 220—207 10 Claims



1. A preassembled pressure relief apparatus adapted to be clamped between a pair of conventional pipe flanges, said pipe flanges having raised face annular seating surfaces and a plurality of bolt members disposed through openings positioned in spaced relationship about said annular seating surfaces which comprises:

a pressure rupturable member;

a pair of complementary supporting members adapted to fit between the pipe flanges and the bolt members thereof having central bores disposed therein for providing a flow passageway between the pipe flanges and for sealingly supporting said pressure rupturable member therebetween across said passageway, having annular seating surfaces to coact with the raised face annular seating surfaces of the pipe flanges and being of a size and shape such that portions of said supporting members extend radially outwardly beyond the boundaries of the raised face annular seating surfaces of the pipe flanges, said portions including complementary openings positioned therein; and

bolt members disposed within said complementary openings in said portions of said supporting members extending radially outwardly beyond the boundaries of the raised face seating surfaces of the pipe flanges for clamping said supporting members and said rupture disk together in preassembly.

4,073,403

PUSH-IN CAN TOP

A. C. Orange, 863 Lakehaven Drive, Sunnyvale, Calif. 94086

Filed July 19, 1976, Ser. No. 706,188

Int. Cl.[2] B65D *41/32*

U.S. Cl. 220—269 1 Claim

1. An easily openable end unit for a container or the like comprising an end panel, a weakening line in said end panel defining a tear panel at least partially removable out of the plane of said end panel, a grippable push-member for rupturing said end panel along said weakening line to push the end panel in a container-inward direction, and attachment means for joining said push-member to said tear panel, wherein said weakening line is substantially a figure of eight having a central portion bulging outwardly within said plane, wherein said push-member is a tab attached to said central portion, normally

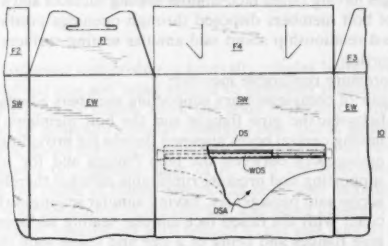
disposed substantially within said plane and liftable therefrom for pushing said tear panel in the container-inward direction and wherein the attachment means is a rivet, whereby upon said push-member being forced in the container-inward direction said tear panel is removed out of said plane.

4,073,404

DISPENSING CARTON FOR WRAPPED DRINKING STRAWS

James R. Brondyke, Finksburg, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

Filed Sept. 27, 1976, Ser. No. 726,531
Int. Cl.[2] B65H *3/34*
U.S. Cl. 221—63 **8 Claims**



1. A dispensing carton for wrapped drinking straws having individual wrappers with tips extending beyond both ends of the straws, comprising:

an elongated hollow carton of a length substantially identical to the length of a drinking straw wrapper;

a plurality of wrapped drinking straws disposed in a mutually parallel stack lengthwise within said carton each said wrapped drinking straw comprising a straw and a tubular wrapper containing said straw, said tubular wrapper including closed end tips extending beyond the ends of said straw; and

an elongated dispensing slot defined in a sidewall of said carton and extending lengthwise thereof substantially parallel to said wrapped drinking straws;

said dispensing slot being of a length less than that of said drinking straw wrappers and greater than that of straws contained in said wrappers to preclude free passage of a said wrapped straw through said dispensing slot by engagement of said sidewall adjacent said slot by the said closed end tips of said wrappers.

4,073,405

GIFT-DISPENSING DEVICE

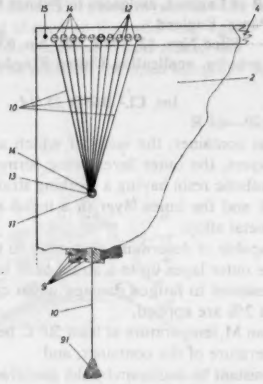
Gabriele Richter, nee Redomske, 8 Wiesenstrasse, D-5481 Remagen-Unkelbach, Germany

Filed Oct. 19, 1976, Ser. No. 733,754
Claims priority, application Germany, Aug. 10, 1976, 7625057[U]
Int. Cl.[2] A63F *9/00*
U.S. Cl. 221—89 **13 Claims**

1. A gift dispensing device for distributing gifts to children, particularly a replica of a figure which dispenses gifts during the Advent period, comprising:

a. a support upon the front of which a replica of a figure is exhibited with at least one arm;

b. a plurality of containers suspended from each arm;



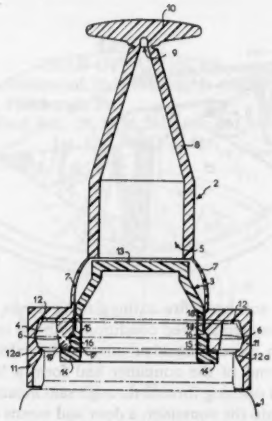
c. dispensing means disengageable with said support and connected to said containers for lowering said containers.

4,073,406

CONTAINER FOR STORING TWO PRODUCTS SEPARATELY AND DISPENSING A MIXTURE THEREOF

Antonin L. Goncalves, Groslay, France, assignor to L'Oreal, Paris, France

Filed Nov. 8, 1976, Ser. No. 740,066
Claims priority, application France, Nov. 17, 1975, 75 35033
Int. Cl.[2] B65D *35/22*
U.S. Cl. 222—94 **12 Claims**



1. In a container for storing a liquid product and at least one additional product separately, and for dispensing a mixture of said products, said container comprising:

a body for holding said liquid product,

a hollow cap for said body, said cap defining therewithin a chamber adapted to hold said additional product, and an orifice positioned between said chamber and the interior of said body when said cap is in position on said body, and

a separating plug adapted to seal said chamber off from said body,

the improvement which comprises:

an inner skirt formed in said cap encircling said orifice,

a deformable dome formed in said cap above said skirt, and

a relatively rigid dispensing spout connected to the top of said dome said spout being pivotable,

said plug having a lateral wall at least part of which is adapted to be gripped by said skirt and said plug projecting into said dome to an extent such that, when said spout is swung laterally, thus deforming said dome, a part of the spout is pressed against the plug to eject it from said skirt.

4,073,407

DISPENSING CONTAINER WITH FRANGIBLE WEBS

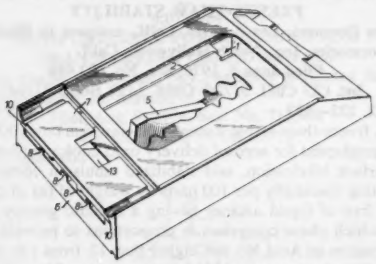
Harry Pentney, Spencers Wood, England, assignor to The Gillette Company, Boston, Mass.

Filed Aug. 16, 1976, Ser. No. 714,509

Claims priority, application United Kingdom, Aug. 15, 1975, 34148/75

Int. Cl.[2] B65D *83/10*

U.S. Cl. 221—102 **9 Claims**



1. A dispensing container for double edged razor blades, comprising a storage compartment for a stack of blades and a dispensing opening at one end of the compartment, wherein the dispensing opening is defined by first and second portions of a single, integral moulding, which portions are substantially spaced apart in the moulded condition of the moulding, but are relatively movable into a final position in which they are closer together to define the dispensing opening, said first portion being fast with said compartment and said second portion being connected initially to the remainder of the moulding by thin webs which are readily frangible to permit displacement of the second portion into its final position.

4,073,408

APPARATUS FOR MIXING PLASTICS

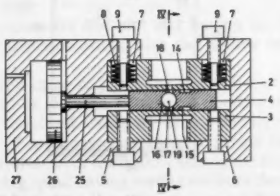
Peter Rudolf Hartwig, Hilchenbach, Germany, assignor to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Germany

Filed Mar. 4, 1976, Ser. No. 663,870

Claims priority, application Germany, Apr. 10, 1975, 2515579

Int. Cl.[2] B67D *5/60*

U.S. Cl. 222—145 **4 Claims**



1. Apparatus for producing a chemical reactive mixture of two plastic components residing in a first and a second container, comprising:

(a) a main housing (5) having a cylinder bore in which is slidably mounted a first piston witha first piston rod extending out of the housing,

(b) a pair of plates (2, 3) fastened to the housing and having spaced parallel facing plane surfaces extending parallel to the axis of the first piston rod,

(c) a control member 4 fastened to the first piston rod and having opposed parallel planar surfaces which slide between the said facing surfaces, one of the plates being fixedly fastened to the housing, while the other plate is movable laterally of its plane surface, a mixing chamber bore extending through the member with its axis perpendicular to the axis of the first piston,

(d) resilient means pressing the said other plate toward the said one of the plates, thus clamping the control member firmly, and

(e) a cylinder integral with the control member with a second piston slidable therein and having a second piston rod slidable in the mixing chamber bore in the member,

(f) a pair of spaced passages through one of the plates for connection to the first container for providing a first plastic component to the exterior of one of the plates,

(g) a pair of spaced passages through the other of the plates for connection to the second container for providing a second plastic component to the exterior of the other of the plates,

(h) a transverse groove on each side of the control member for connecting each pair of passages on occasion, and

(i) a passage entering each side of the control member and leading to the mixing chamber bore, these passages lining up on occasion with one of each pair of spaced passages.

4,073,409

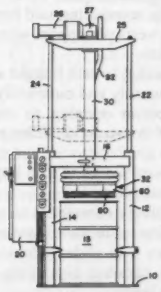
HOT MELT DISPENSER WITH REMOVEABLE PUMP IN FOLLOWER

James J. Gardner, and Hugh Paul Koppehele, both of Hamilton, Ohio, assignors to Fluid Kinetics, Inc., Fairfield, Ohio

Filed Jan. 12, 1977, Ser. No. 758,571

Int. Cl.[2] B67D *5/62*

U.S. Cl. 222—146 HE **7 Claims**

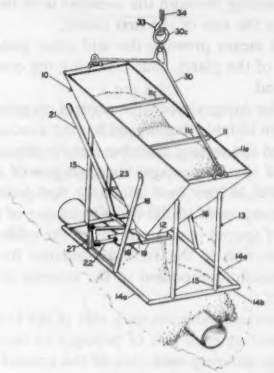


4. In a dispenser having a follower plate carried on a support tube, the improvement comprising means in said plate defining a pump receiving housing in generally axially alignment with said support tube, a cartridge-type gear pump having a cylindrical body received in said housing, means sealing said pump body at said housing, means in a lower end of said body defining a pump inlet to receive material to be dispensed, said pump being removable from said plate pump housing by sliding upwardly from said housing and through said support tube without otherwise disturbing said plate.

4,073,410
CONSTRUCTION FILLER MATERIAL DISPENSING APPARATUS

Herbert R. Melcher, P.O. Box 109, Pound, Wis. 54164

Filed Sept. 8, 1976, Ser. No. 721,472
Int. Cl.[2] B67D 5/06
U.S. Cl. 222—181 4 Claims



1. Construction filler material dispensing apparatus suspendable from an overhanging vertical support, comprising:

a. a rectangular hopper having an open top and converging downwardly to a discharge opening at the bottom thereof which is substantially smaller than the open top of said hopper, the longitudinal dimension of the top of said hopper being greater than the lateral dimension thereof;

b. a support frame for supporting said hopper having a rectangular base and a plurality of support legs extending upwardly from attachment to said base to attachment to said hopper, said rectangular base including longitudinal members extending laterally outward beyond the rectangular top of said hopper and wherein said support legs include a lateral buttress leg on each side of said hopper attached at their bottoms to said longitudinal members and which extend upwardly and inwardly to attachment to said hopper, whereby said dispensing apparatus has substantial lateral stability when said hopper is supported on the ground by said support frame and said hopper may be maintained away from the sides of a trench by said outwardly extending rectangular base;

c. hanger means for suspending said hopper and frame from an overhanging vertical support when said hanger means is engaged thereto;

d. a slide gate mounted to said hopper at the bottom thereof and movable inwardly and outwardly to selectively cover said hopper bottom opening to control the discharge therethrough of construction filler material contained in said hopper;

e. a lever pivotally mounted to said hopper for rotation in a generally vertical plane; and

f. a linkage operatively connected to said lever and to said slide gate such that rotation of said lever about its pivotal mounting moves said slide gate to open or close said hopper bottom opening depending on the direction of rotation of said lever.

4,073,411
FREEZE-THAW STABLE EMULSION COOKWARE LUBRICANT

Charles Doumani, Los Angeles, Calif., assignor to Blue Cross Laboratories, Inc., North Hollywood, Calif.

Filed June 3, 1976, Ser. No. 692,485
Int. Cl.[2] C08L 91/00; C09K 3/30; B65D 83/14
U.S. Cl. 222—192 20 Claims

1. A freeze thaw-, and hydrolysis-stable, water-in-oil emulsion composition of lecithin adapted for aerosol delivery onto cookware for cooking surface lubrication, said emulsion composition consisting essentially per 100 parts by weight of (a) an organic phase free of hydrocarbon liquids having a specific gravity above 0.80, which phase comprises in proportions to provide to the composition an Acid No. not higher than 12: from 1 to 10 parts of a lecithin having an Acid No. between 24 and 35; from 0 to about 8 parts of a vegetable oil having an Acid No. less than about 1; from about 2 to 7 parts of a liquid, saturated aliphatic compound having a specific gravity not higher than 0.75; a freeze thaw-stabilizing effective amount of an organic polyol having a molecular weight between about 76 and 360; and an emulsifying effective amount of an edible fatty acid ester emulsifier having an Acid No. not higher than 15; and (b) an inorganic phase comprising the balance to 100 parts of the composition, which inorganic phase comprises water.

4,073,412
EMULSIFIED COOKWARE LUBRICANT HAVING FREEZE-THAW STABILITY

Charles Doumani, Los Angeles, Calif., assignor to Blue Cross Laboratories, Inc., North Hollywood, Calif.

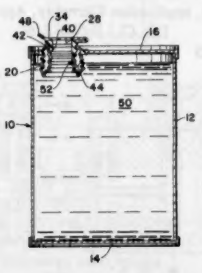
Filed June 3, 1976, Ser. No. 692,486
Int. Cl.[2] C08L 91/00; C09K 3/30; B65D 83/14
U.S. Cl. 222—192 19 Claims

1. A freeze-thaw-stable water-in-oil emulsion composition of lecithin adapted for aerosol delivery onto cookware for cooking surface lubrication, said stabilized emulsion composition consisting essentially per 100 parts by weight of (a) an organic phase free of liquid alkanes having a specific gravity below 0.75, which phase comprises in proportions to provide to the composition an Acid No. not higher than 12: from 1 to 10 parts of a lecithin having an Acid No. between about 24 and 34; from about 0 to about 8 parts of vegetable oil having an Acid No. less than about 1: from 1 to 12 parts of a mineral oil having a specific gravity above 0.80, and an emulsifying effective amount of an edible fatty acid ester emulsifier having an Acid No. not higher than 15; and up to 90 parts of an inorganic phase comprising the balance to 100 parts of the composition, which phase comprises water.

4,073,413
DISPENSING APPARATUS WITH SELF CONTAINED SPOUT

Herman L. Tabler; Regine M. Tabler, and Edwin L. Lokey, all of 313 Ellsworth Place, Oxon Hill, Md. 20024

Filed June 10, 1976, Ser. No. 694,802
Int. Cl.[2] B65D 25/44
U.S. Cl. 222—529 5 Claims



1. A dispensing apparatus with self contained spout comprising a container, an opening in said container, a flexible corrugated elongated cylindrical tubular spout, one end of said corrugated spout fixedly secured to the interior surface of said container surrounding said opening, openable closure means for selective closure of the other end of said corrugated spout, said other end of said corrugated spout passing through said opening and residing outwardly from the exterior surface of said container adjacent said opening, first portion of the length

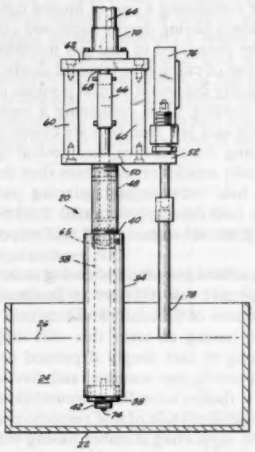
of said corrugated spout being disposed residing within second portion of said length of said corrugated spout when said other end of said corrugated spout is disposed in an adjacent position to said exterior surface, said first portion of the length of said corrugated spout being disposed outwardly and adjacent to said second portion of the length of said corrugated spout when said other end of said corrugated spout is disposed outwardly from said adjacent position, spout locking means for removably locking said corrugated spout in said everted position, said spout locking means including a second flange, said second flange fixedly secured adjacent said other end of said corrugated spout and extending radially outwardly therefrom, a third flange, said third flange being fixedly secured to said exterior surface surrounding said opening and extending radially inwardly therefrom, said second flange being disposed intermediate said third flange and the interior confines of said container when said other end of said corrugated spout is disposed in said adjacent position.

4,073,414

AUTO CRUCIBLE FOR METERING AND TRANSFERRING LIQUID METALS

H. Gary Garab, Rensselaer, N.Y., assignor to Albany International Corporation, Albany, N.Y.

Filed Aug. 9, 1976, Ser. No. 712,938
Int. Cl.[2] B22D *39/00, 41/10*
U.S. Cl. 222—602 **15 Claims**



1. A device for metering and transferring liquid metals comprising:

a support structure;

a hollow sleeve on the supporting structure and an opening at both ends;

a pouring spout on one end and having an orifice therethrough communicating with the hollow interior of the sleeve;

a stopper rod extending into the sleeve from the other end thereof to be shiftable between a position seating on the pouring spout and sealing the orifice therein and a position removed from the pouring spout to permit liquid metal to flow into and out of the hollow sleeve, the stopper rod and the pouring spout having mating surfaces thereon to facilitate sealing engagement therebetween when the stopper rod is in the seating position to prevent leakage;

means for shifting the stopper rod between positions the means for shifting the stopper rod between positions including axial drive means and rotary drive means to permit the stopper rod to be rotated with respect to the pouring spout and sleeve and to be axially shifted with respect to the pouring spout and sleeve and operating so that when the stopper rod is directed into mating engagement with the pouring spout it will be both axially and rotatably brought into mating engagement thereby facilitating sealing of the stopper rod and pouring spout to prevent leakage;

means for transferring the device into and out of a container of liquid metal with the stopper rod being in the seated position on the pouring spout during insertion into the liquid metal to facilitate prevention of accumulation of undesirable materials within the hollow sleeve during the insertion into the liquid metal to the desired depth;

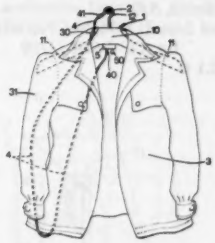
means for cleaning the orifice and for preventing undesirable materials from collecting in the orifice including the end of the stopper rod adjacent the pouring spout having a small diameter tip portion extending therefrom of a predetermind length so that when the stopper rod is seated in sealing position on the pouring spout the tip will extend through the orifice in the pouring spout thereby guarding against the accumulation of foreign matter in the orifice while the device is being transferred into a container of liquid metal, and when the stopper rod is removed from the seating position on the pouring spout the tip will be removed therefrom to permit liquid metal to freely flow through the orifice in the pouring spout and the tip acting to remove any collection of undesirable material from the orifice upon reinsertion therein as it is rotated and axially moved with the stopper rod as the stopper rod is reseated on the pouring spout.

4,073,415

GARMENT HANGER SECURITY DEVICE

Frank Raymond Pegg, Taurus House, Kingfield Road, Coventry West Midlands, England

Filed Nov. 8, 1976, Ser. No. 739,805
Claims priority, application United Kingdom, Nov. 12, 1975, 46807/75
Int. Cl.[2] A47J *51/093*
U.S. Cl. 223—92 **4 Claims**



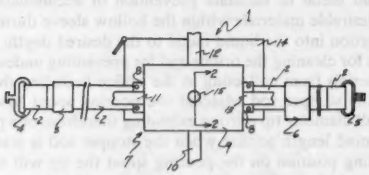
1. A garment hanger with means for securing a garment thereto, said garment hanger comprising a central body; a pair of oppositely directed horizontal arms extending from said central body; a central suspension hook attached to said central body and extending away therefrom, said central suspension hook having a terminal upper end part; a strong, flexible means permanently and securely attached at one end to said upper end part of said central suspension hook, said means being of a sufficient length so that it can pass through the sleeve of a garment when the garment is hung on said horizontal arms of said garment hanger; a pin permanently and securely attached to the second end of said strong, flexible means; and a key-operated lock means permanently and securely attached to said central body for receiving said pin; whereby when a garment is hung on said garment hanger and said garment hanger hung on a rail by means of said central suspension hook, and when said strong, flexible means is passed through a sleeve of said garment, said pin is placed in said lock means, said garment is securely connected to said garment hanger and said garment hanger is securely connected to said rail.

4,073,416

CARRYING BELT FOR CB RADIOS AND SIMILAR DEVICES

Kenneth McComber, 2994 Foxwood, Bridgeton, Mo. 63042

Filed Aug. 6, 1976, Ser. No. 712,354
Int. Cl.[2] A45F 5/00
U.S. Cl. 224—5 H 3 Claims



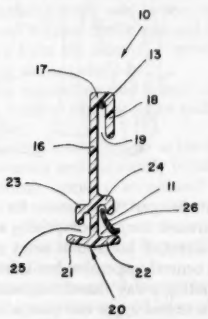
1. A CB carrying belt comprising,
adjustable belt means,
securing means operably mounted on each end thereof,
pocket means mounted on said belt means,
harness means mounted on said belt means, said harness means comprising,
pivotal mounting means operably mounted on said belt means,
pad means operably mounted on said pivotal mounting means so as to allow pivoting of the pad in a plane parallel to said belt means,
a plurality of belt means operably attached to said pivotal mounting means, said point of attachment being disposed between said pad and said belt means, the free ends of said belt means being disposed about the edges of said pad means and secured to ring means disposed on the side of said pad means opposite to said belt means, one of said belt means being provided with snap means on its free end and said snap means connected to said ring means.

4,073,417

VEHICULAR ANTENNA HOLD DOWN BRACKET

Leon F. Fulmer, Sr., Newberry, S.C., assignor to Shakespeare Company, Columbia, S.C.

Filed June 1, 1976, Ser. No. 691,498
Int. Cl.[2] B60R 11/00
U.S. Cl. 224—42.1 G 4 Claims



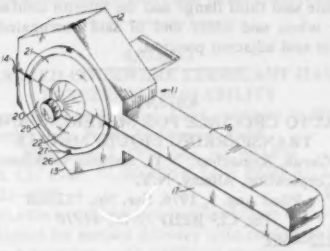
1. A unitary bracket for holding down a flexible antenna of the type mounted on vehicles, the vehicles having gutter strips thereon the configuration of which may vary from vehicle to vehicle, the bracket comprising an elongate body portion, first fluke means formed on one end of said body portion and engagable with the top of a gutter strip of a first configuration, first wedge means opposed to said first fluke means and engagable with the gutter strip of said first configuration near the bottom thereof to form with said first fluke means a recess for the gutter strip of said first configuration, second fluke means formed on said one end of said body portion and engagable with the top of a gutter strip of a second configuration, second wedge means opposed to said second fluke means and engagable with the gutter strip of said second configuration near the bottom thereof to form with said second fluke means a recess for the gutter strip of said second configuration, said recess for the gutter strip of said second configuration being of lesser longitudinal extent than said recess for the gutter strip of said first configuration, and means formed on the other end of said body portion adapted to receive and hold the antenna.

4,073,418

HOLDER FOR ARTIST PAINT TUBES

Harold C. Edson, 1449 W. 17th, Davenport, Iowa 52804

Filed Feb. 28, 1977, Ser. No. 772,525
Int. Cl.[2] A45C 11/00
U.S. Cl. 224—45 R 1 Claim



1. A holder comprising a pair of hinged rigid jaw members, said jaw members having deeply depressed central portions, a pair of handles connected to said jaw members,
a gripping pad of cushioning material positioned within each of said deeply depressed central portions of said jaw members for holding tubes containing a paste, said gripping pads while said jaw members are closed providing a central opening therebetween, said central opening having a substantially smaller cross section than that of a tube that is to be held between said gripping pads, each of said gripping pads having substantial thickness between the boundary of said opening and said respective jaw members,
at least one of said gripping pads being removably secured to said respective jaw member to facilitate changing pads with cushions of different thickness, said removable gripping pad having an inner thin stiff supporting member conforming to said deeply depressed central portion of said respective jaw member and having on each side thereof a flange extending circumferentially outwardly over the adjacent side of said respective jaw member, said inner stiff supporting member having sufficient elasticity to urge said flanges inwardly tightly against the sides of said respective jaw member to secure said inner stiff supporting member, at least one of said flanges having a slot as a keyway through the rim thereof, and a pin as a key extending through said keyway from the adjacent side of said respective jaw member.

4,073,419

THREAD STORAGE AND DISPENSING SYSTEM

Emanuel B. Tarrson; Steven Tisma, both of Stream Wood, and Donald Ritch, Nile, all of Ill., assignors to John O. Butler Company, Chicago, Ill.

Filed Apr. 19, 1976, Ser. No. 678,138
Int. Cl.[2] B26F 3/02; B65H 35/10
U.S. Cl. 225—44 10 Claims

6. A thread holder comprising a two part shell, each of said parts comprises a generally cylindrical container having an open end, said containers snapping together at their open ends, the rim of one of said parts flaring outwardly to form a cylindrical section and the rim of the other of said parts telescopingly fitting into said cylindrical section, an opening formed in the rim of at least one of said parts to enable the thread to pass out of said holder, one of said parts being closed by a closure

plate having at least one semipierced detent formed thereon for cutting and anchoring the thread, the other of said parts including a platform for supporting one end of a spool to enable a rotation of said spool inside said holder with a minimum amount of friction between the spool and the holder, and said one part including means for contacting and dragging with predetermined friction against the top of the spool, the friction being great enough to prevent an unwanted and random unwinding of the spool of thread and yet small enough to preclude any substantial opposition to a desired withdrawal of thread, said dragging means comprises a spider assembly including a plurality of arms interspersed with a plurality of fingers spaced around the circumference of the part in which said assembly is positioned, one of said fingers being disposed between each adjacent pair of said arms and adapted to drag with predetermined friction against the top of the spool.

4,073,420

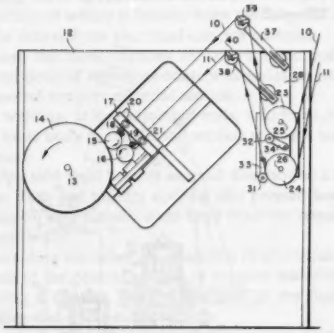
PULL ROLL APPARATUS

John R. Tolan, South Bend, Ind., assignor to Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 616,500, Sept. 24, 1975, abandoned. This application Dec. 16, 1976, Ser. No. 751,516

Int. Cl.[2] B65H *25/04*

U.S. Cl. 226—42 **2 Claims**



1. Apparatus to supply a plurality of continuous cords to a drum comprising:

a frame;

a drum rotatably mounted on said frame;

a first pulley member having a groove around its outer periphery pivotably mounted on said frame;

a second pulley member having a groove around its outer periphery pivotably mounted on said frame;

a first arm mounted on said first pulley;

a second arm mounted on said second pulley;

a third pulley rotatably mounted on said first arm at one end thereof;

a fourth pulley rotatably connected to said second arm at one end thereof;

a first drive sprocket operably connected to said first arm at the end opposite to said third pulley;

a second drive sprocket operably connected to said second arm at the end opposite to said fourth pulley;

a first roll means for supplying continuous cord over said third pulley to said drum;

a second roll means for supplying a continuous cord over said fourth pulley to said drum;

biasing means biasing each arm against the traction of said cord, each said biasing means including a pin member disposed within the groove of said pulley member, a spring member one end of which is attached to said pin member the other end of which is attached to said frame;

a separate drive means for each of said rolls, each said drive means including a one-way clutch means;

a first potentiometer, having a shaft and operably connected with the drive means for first roll;

a second potentiometer, having a shaft and operably connected with the drive means for said second roll;

a first driven sprocket mounted on the shaft of the first potentiometer;

a second driven sprocket, mounted on the shaft of said second potentiometer;

a first chain means connecting the first driven sprocket to the first drive sprocket; and

a second chain means connecting the second driven sprocket to the second drive sprocket.

4,073,421

APPARATUS FOR PICKING UP RAPIDLY RUNNING FILAMENTS

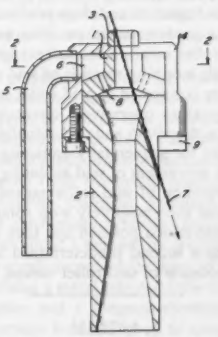
Christian Reufer, Nottwil, Switzerland, assignor to Viscosuisse SA, Emmenbrucke, Switzerland

Filed Apr. 2, 1975, Ser. No. 564,235

Claims priority, application Germany, Apr. 22, 1974, 2419298

Int. Cl.[2] B65H *17/32*

U.S. Cl. 226—97 **6 Claims**



1. In an apparatus for picking up rapidly running filaments comprising an ejector operated by compressed air, said ejector having propulsion jets therein and a propulsion tube leading therefrom, said ejector having an inlet opening disposed above said propulsion jets and an outlet at the end of said propulsion tube, the improvement comprising a lateral lead-in passage formed in the body of said ejector for receiving filaments, said passage providing a path for filaments to be picked up, said path being inclined to the longitudinal axis of the ejector, and said path extending from said inlet opening of the ejector, passing the exit openings of the propulsion jets and leading laterally from said propulsion tube, said propulsion jets being disposed in a generally circular pattern around the interior of

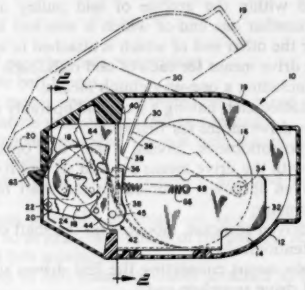
said propulsion tube and adjacent said inlet, the exit openings of said propulsion jets being disposed generally about a single plane passing transversely of the longitudinal axis of said ejector.

4,073,422

TICKET DISPENSER

Herman Palter, University Heights, Ohio, assignor to Service Sequence Systems, Cleveland Heights, Ohio

Filed Jan. 24, 1977, Ser. No. 761,717
Int. Cl.[2] B65H *17/26*
U.S. Cl. 226—129 **14 Claims**



1. A ticket dispenser comprising a housing, said housing including a chamber therein for locating a roll of tickets to be dispensed therein, roller means having a plurality of gripping means thereon for gripping tickets on the roll of tickets to effect a positive displacement of a ticket from said chamber in said housing upon rotation of said roller means, cyclicable actuating means for effecting rotation of said roller means to thereby dispense the ticket, and means operatively connected to said roller means and engageable with said actuating means to enable said actuating means to rotate said roller means to dispense a ticket upon movement of said actuating means through a single cycle, said actuating means upon movement through a single cycle effecting rotation of said roller means a first predetermined amount and then positively stopping said roller means in a predetermined position and then effecting rotation of said roller means a second predetermined amount and then positively stopping rotation of said roller means, said means operatively connected to said roller means including a plurality of projections operatively connected to said roller means for rotation therewith and said actuating means includes a plurality of tabs for sequentially engaging said plurality of projections upon movement of said actuating means through a cycle to effect rotation of said roller means a first predetermined amount and then positively stop rotation of the roller means in a predetermined position and then effect rotation of said roller means a second predetermined amount and then positively stop rotation of said roller means.

4,073,423

FURNITURE CLIP ATTACHMENT DEVICE

Herbert A. Omley, Wickenburg, Ariz., assignor to Omley Industries, Inc., Wickenburg, Ariz.

Filed Jan. 3, 1977, Ser. No. 756,017
Int. Cl.[2] B27F *7/00*
U.S. Cl. 227—7 **6 Claims**

1. An automatic driving mechanism for attaching clips used for securing one end of a spring to a furniture frame member comprising:

a frame,

a rail assembly mounted on said frame for guiding an elongated piece of lumber across said frame,

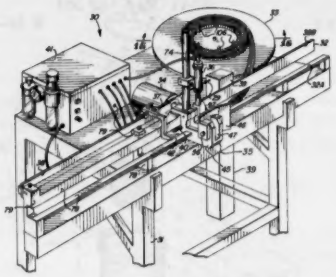
means mounted on said frame for supporting a strip of sequentially interconnected clips,

piston means for reciprocally moving laterally to and from said rail assembly,

clip feeding means for moving the free end of said strip of clips longitudinally of said rail assembly with the foremost clip fed in front of said piston means,

said piston means shearing a clip from said strip and sequentially driving it into the piece of lumber,

circuit means comprising a portion mounted to extend longitudinally of said rail assembly,



means movable along at least a part of said rail assembly and actuated by a piece of lumber moving therealong for periodically completing during its movement an electrical circuit through said circuit means,

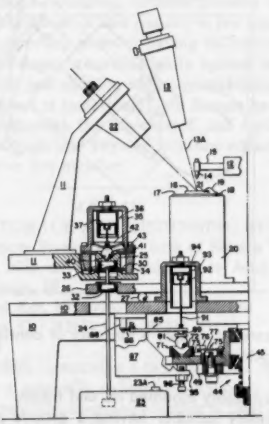
the completion of said circuit actuating said piston means for engaging a clip moved into its path of movement, shearing it from the strip of clips, and driving it laterally across at least a part of said rail assembly into the piece of lumber moved along said rail assembly into the path of movement of the severed clip.

4,073,424

SECOND BOND POSITIONING WIRE BONDER

Frederick W. Kulicke, Jr., Philadelphia; Albert Soffa, Wynnewood, both of Pa.; Dan Vilenski, and Asher Brockmann, both of Haifa, Israel, assignors to Kulicke and Soffa Industries Inc., Horsham, Pa.

Filed Aug. 17, 1976, Ser. No. 715,042
Int. Cl.[2] H01L *21/60*
U.S. Cl. 228—4.5 **20 Claims**



1. A wire bonding machine of the type having a second bond positioning apparatus comprising:

a rigid frame,

a movable platform supported on said rigid frame,

a manipulator operably connected to said rigid frame for positioning said movable platform in a horizontal plane to a plurality of different first and second bonding positions,

means for disabling said manipulator from its operable connection to said rigid frame,

second bond positioning means comprising a movable frame mounted on said rigid frame and having a plurality of individually adjustable positioning devices thereon,

second bond position actuating means mounted on said movable platform and adapted to cooperate with said individual adjustable positioning devices on said movable frame, and

control means for activating said second bond position actuating means and said means for disabling said manipulator from its operable connection to said rigid frame, whereby said movable table is positioned to one of said plurality of second bond positions defined by said second bond positioning means.

4,073,425

METHOD OF AND APPARATUS FOR MANUFACTURING DOUBLE CONTACT RIVETS

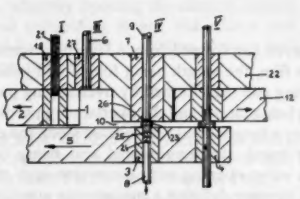
Erwin Bollian, Rastatt, Germany, assignor to Eugen Durrwachter Doduco, Pforzheim, Germany

Filed Dec. 2, 1976, Ser. No. 747,044

Claims priority, application Germany, Dec. 11, 1975, 2555697

Int. Cl.[2] B23K *21/00*; B21K *1/62*

U.S. Cl. 228—116 **6 Claims**



1. A method of manufacturing double-contact rivets which rivets consist of a support material and materials for the electrical contact providing parts different from said support material, said method comprising the steps of:-

(a) forming three cylindrical sections from supply sources, one section of which is formed from said support material and the others from electrical-contact material;

(b) aligning the three sections to form a basic body, with outer sections of electrical-contact material on either side of a central support material section;

(c) cold welding, at the adjoining ends, a first outer section of the basic body to the central section so that a weld bead is formed;

(d) pressing said weld bead in an axial direction to a substantial flat form and rapidly cooling said pressed bead;

(e) cutting-off said pressed weld bead from the remainder of the basic body;

(f) cold welding the other outer section of electrical-contact material to the central section of support material; and

(g) forming a contact head at the end of the basic body including said other outer section.

4. Apparatus for manufacturing double-contact rivets which rivets consist of a support material and materials different from said support material for the electrical contact providing parts of the rivet, said apparatus comprising:-

(a) means for forming three cylindrical sections from supply sources, one section being formed from support material and the other sections being formed from electrical-contact material;

(b) means for aligning the three sections to form a basic body with outer sections of electical-contact material on either side of a central section of support material;

(c) first welding means for cold welding a first outer section of the basic body to the control section so that a weld bead is formed;

(d) means for pressing said weld bead in an axial direction;

(e) means for cutting-off said pressed weld bead from the remainder of the basic body;

(f) second welding means for cold-welding the other outer section to the central section; and

(g) means for forming a contact head at the end of the basic body including said other outer section; said pressing means comprising an axially-movable die and a sleeve member for receiving the basic body facing and aligned with said die, a gap being provided between said die and said sleeve member to permit the formation of the weld bead, the die being adapted to hold the bead against the sleeve member during bead cutting.

4,073,426

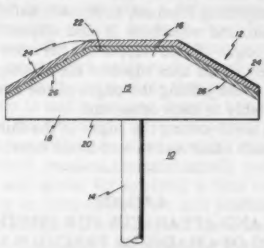
METHOD FOR JOINING AN ANODE TARGET COMPRISING TUNGSTEN TO A GRAPHITE SUBSTRATE

Thomas M. Devine, Jr., Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 18, 1977, Ser. No. 788,244

Int. Cl.[2] B23K *31/02*

U.S. Cl. 228—122 **21 Claims**



1. A method for joining an anode target to a graphite substrate of a disc for use in a rotating x-ray anode tube comprising the process steps of

a. preparing a graphite substrate for assembling an anode target to a preselected surface area thereof;

b. disposing a layer of a metal of a predetermined thickness on the preselected surface area of the substrate, the layer of metal having a predetermined thickness and comprising a metal selected from the group consisting of rhodium, osmium, ruthenium, platinum, palladium and an alloy of platinum and chronmium, wherein chromium is present in amounts up to about 1 percent by weight;

c. disposing an anode target on the layer of metal, the anode target comprising a metal selected from the group consisting of tungsten and a tungsten-rhenium alloy wherein rhenium is present in amounts up to about 25 percent by weight;

d. preheating the substrate, layer of metal and anode target in a controlled atmosphere at a first elevated temperature of from about 600° to about 900° C for a predetermined period of time;

e. heating the substrate, the metal layer and the anode target to a second elevated temperature of from about 1770° to 1830° C for a predetermined period of time up to 5 minutes in a controlled atmosphere to braze the anode target to the preselected surface area of the substrate, and

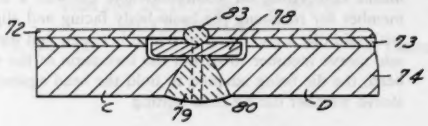
f. cooling the substrate, metal layer and anode target in a controlled atmosphere to a low enough temperature to permit exposure to the atmosphere.

4,073,427

LINED EQUIPMENT WITH TRICLAD WALL CONSTRUCTION

Hibbard G. Keifert, Torrance, Calif., and Einar R. Jenstrom, Bridgewater, N.J., assignors to Fansteel Inc., North Chicago, Ill.

Filed Oct. 7, 1976, Ser. No. 730,347
Int. Cl.[2] B23K *31/02*; F16B *5/08*
U.S. Cl. 228—165 16 Claims



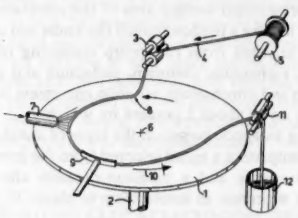
1. A joint for a wall assembly comprising:
(a) abutting edges of a composite wall of a first layer of a first metallic material, an intermediate layer of a second metallic material, and a third layer of a third metallic material, with one face of the first and third materials in a face-to-face relation with a face of the second material, and a channel formed in an area adjacent the edges of the first and third layers extending into the intermediate layer between the first and third layers, the third layer being metallurgically incompatible with and not directly weldable to the first layer,
(b) an inlaid insert of a material selected from metals and alloys comprising titanium, zirconium, hafnium, tantalum, columbium, and vanadium in said channel bridging the abutting edges of and supported between the first and third layers in the area adjacent the abutting edges.
(c) a fusion weld joining the edges of the first layer of the wall assembly to each other, and
(d) a fusion weld joining the edges of the third layer of the wall to each other and to said inlaid insert.

4,073,428

METHOD AND APPARATUS FOR CONTINUOUSLY SOLDERING OF CHAINS OF PRECIOUS METALS OR PLATED THEREWITH

Hans Gustav Erik Wahlbeck, Nybble, S-150 32 Stallarholmen, Sweden

Filed Apr. 8, 1976, Ser. No. 675,229
Claims priority, application Sweden, Apr. 11, 1975, 7504197
Int. Cl.[2] B23K *1/00*
U.S. Cl. 228—178 15 Claims



1. Method of continuously soldering the abutting ends of links of chains of precious metals, comprising applying solder at the said abutting ends of each link, feeding and placing the said chain downwardly onto a moving substantially horizontal surface at a speed which is slightly greater than the movement of said surface whereby said links are placed on said surface and pushed into each other, heating said chain on said surface to a temperature at which said solder melts, and removing said heated chain from said surface.

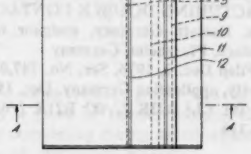
8. Apparatus for continuously soldering the abutting ends of links of chains of precious metals whereby solder is applied to said abutting ends, comprising rotatable horizontal plane means upon which said chain can be continuously placed, feed means for feeding said chain onto said plane means, said feed means having feed control means, and heating means.

4,073,429

PLASTICS BAG

Norman Edward Lawes, Yarm, England, assignor to Imperial Chemical Industries Limited, London, England

Filed June 21, 1976, Ser. No. 698,220
Claims priority, application United Kingdom, July 3, 1975, 28046/75; Aug. 6, 1975, 32850/75; Jan. 23, 1976, 2696/76
Int. Cl.[2] B65D *31/14*
U.S. Cl. 229—62.5 10 Claims



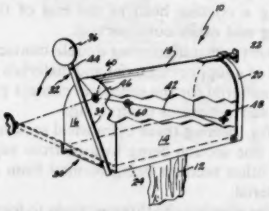
1. A valved bag formed from a length comprising two plies of plastics film, the length being folded and joined to provide a bag having one wall formed by overlapping panels, the ends of the bag being closed and the overlapping panels being joined together by a longitudinal seal located along the edge region of the outer panel, the longitudinal seal being interrupted to provide a valve opening with transverse seals at each side of the valve opening defining a passageway constituting a filling valve between the panels, the outer panel comprising the two plies with their edges coextensive and the inner panel comprising the two plies together with at least one layer of flexible material in addition to said two plies at least throughout the valve region, the two plies and the additional layer which comprise the inner panel being arranged with their edges staggered such that all three edges may contact the inner ply of the outer panel, the additional layer being joined to the two plies of the inner panel at least by the transverse seals and being located with at least one of the plies of the inner panel lying between the additional layer and the outer panel in the area of overlap.

4,073,430

MAILBOX SIGNAL

Albert P. Joris, 80 Maple St., White Cloud, Mich. 49349

Filed Oct. 26, 1976, Ser. No. 735,800
Int. Cl.[2] B65D *91/00*
U.S. Cl. 232—35 18 Claims



1. A mailbox signaling device for inclusion on a receptacle for receiving mail of the type having top, side, end and bottom

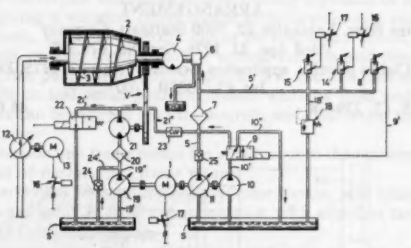
portions and a closure movably mounted over an aperture in the receptacle for access to the receptacle interior, said device comprising a signaling member having a signal portion at one end thereof; pivot means for pivotally securing said signaling member to one portion of a mail receptacle of the stated type; elongated, flexible connecting means having opposite ends for extending through the interior of the mail receptacle and outwardly of the receptacle for connection to said signaling member; means for mounting said connecting means for sliding movement including an aperture in the mail receptacle which opens from the interior to the exterior thereof; first means for attaching one of said ends of said connecting means to said signaling member at a location spaced along said signaling member from said pivot means; and second means for releasably securing the other of said ends of said connecting means to an interior surface of the receptacle closure such that said other end will be released when the closure is moved to its open position; said flexible connecting means extending from said closure through said receptacle interior, said aperture and connected to said location on said signaling means with said first means and having an overall length and strength sufficient to hold said signaling member in a raised, visible position such that at least a portion thereof is visible above the top of said receptacle when said releasable second means is secured to said interior surface of the closure and the closure is in its closed position, said raised, visible position being such that release of said second means from said closure will cause said signaling member to drop by gravity to a lower fallen position while pulling a portion of said flexible connecting means through said aperture, whereby opening the closure releases said second means and connecting means and allows said signaling means to pivot downwardly to a fallen position indicating the closure has been opened.

4,073,431

SOLID JACKET WORM CENTRIFUGE WITH RPM DIFFERENTIAL VARIABLE COUPLING BETWEEN JACKET PART AND WORM PART

Ernst Adolf Jäger, Vilsbiburg, Germany, assignor to Flottweg-Werk Dr. Georg Bruckmayer GmbH & Co. KG, Germany

Filed Nov. 18, 1976, Ser. No. 743,077
Claims priority, application Germany, Nov. 18, 1975, 2551788
Int. Cl.² B04B *1/20, 9/10*
U.S. Cl. 233—7 **18 Claims**



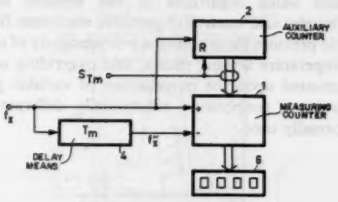
1. A solid-shell screw-conveyor centrifuge which includes a shell and a screw rotating at differential speeds, a drive means for driving one of the shell and screw and a hydraulic motor for driving the other of the shell and screw, and rotary transmission means for supplying a pressure medium to the hydraulic motor, characterized in that the drive means is a second hydraulic motor, which, in a first operating condition, drives one of the screw and the shell and, in a second operating condition, is driven by one of the shell and screw so as to function as a pump, said second hydraulic motor including a pump discharge means, means are provided for communicating said pump discharge means with a pressure medium supply conduit for the rotary transmission means and the first hydraulic motor, and in that control means are provided for controlling the communication between the pump discharge means and the pressure medium supply conduit.

4,073,432

CIRCUIT ARRANGEMENT FOR DETERMINING THE AVERAGE VALUE OF A FREQUENCY

Gerd Schröder, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 12, 1976, Ser. No. 741,213
Claims priority, application Germany, Nov. 20, 1975, 2552079
Int. Cl.² G01R *23/02;* G06M *3/14*
U.S. Cl. 235—92 FQ **9 Claims**



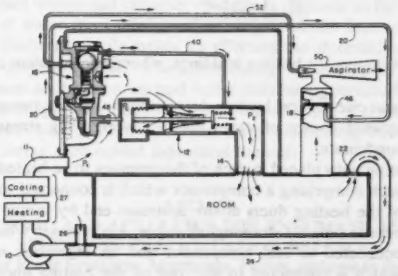
1. A circuit arrangement for determining the average value of the frequency of a measuring signal during a directly preceding time interval of predetermined constant duration comprising, a delay means providing a delay equal to said time interval, a measuring counter having a count-up input which receives a substantially undelayed measuring signal and having a count-down input which receives the measuring signal after being delayed by the duration of the time interval in said delay means, the count in said measuring counter being a measure of the average of the frequency of the measuring signal in the relevant preceding time interval, an auxiliary counter having a count input which receives the substantially undelayed measuring signal, and means for applying a time control signal, which recurs at an interval equal to said predetermined time interval, to the auxiliary counter so that the count of the auxiliary counter is transferred to the measuring counter and immediately thereafter sets the auxiliary counter to zero.

4,073,433

CONTROL APPARATUS FOR WARM UP CYCLE OF AIR DISTRIBUTION SYSTEM

Edward Modes, Deerfield, Ill., assignor to Powers Regulator Company, Skokie, Ill.

Filed July 22, 1976, Ser. No. 707,900
Int. Cl.² F24F *11/04*
U.S. Cl. 236—49 **14 Claims**



1. An apparatus for controlling the ambient temperature in an enclosed area by regulating the flow of variable-pressure, conditioned air into said enclosed area, said apparatus comprising:

pressure regulator means having a pressure chamber for converting a portion of said variable pressure air to sub-

stantially constant pressure air provided in said pressure chamber;

signal generating communicating with said pressure chamber means for generating a pressure signal indicative of said ambient temperature, and including means for sensing said ambient temperature;

an air volume controller for metering said variable-pressure, conditioned air to said enclosed area, said pressure signal acting directly on said air controller; and

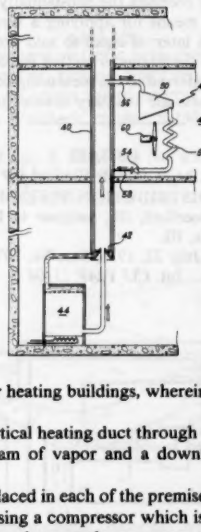
overriding means interacting with said pressure regulator means for overriding said signal generating means by reducing the pressure in said pressure chamber to a sufficiently low level so that said pressure signal is at a minimum value regardless of the ambient temperature, whereby said controller provides maximum flow of variable pressure air to said area independently of said ambient temperature sensing means, said overriding means being activated upon the introduction of variable pressure air having a temperature substantially different from that normally used.

4,073,434

SYSTEM FOR HEATING BUILDINGS

Maurice Dumont, St-Ismier, and Gérard Marie, Eybens, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed July 29, 1976, Ser. No. 709,944
Claims priority, application France, Aug. 5, 1975, 75 24405
Int. Cl.² G05D *23/00*
U.S. Cl. 237—2 B **2 Claims**



1. A system for heating buildings, wherein said system comprises:

at least one vertical heating duct through which is passed an upward stream of vapor and a downflowing stream of condensate,

heating units placed in each of the premises to be heated and each comprising a compressor which is connected to one of the heating ducts at the upstream end by means of a branch pipe for drawing-off vapor, a condenser which is connected to said compressor and an expansion valve which is connected to said one of the heating ducts by means of a condensate return pipe,

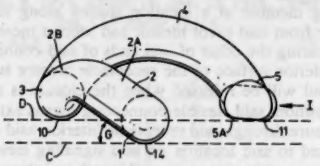
at the lower end of the heating duct, a liquid-vapor separator which collects the condensate and is followed by an evaporator which delivers vapor to the central portion of the heating duct, said evaporator being supplied from an external heat source.

4,073,435

RAILWAY RAIL-FASTENING CLIP AND A RAILWAY RAIL-AND-FASTENING ASSEMBLY EMPLOYING IT

David William Miller, Retford, England, assignor to Pandrol Limited, London, England

Filed Nov. 4, 1976, Ser. No. 738,963
Claims priority, application United Kingdom, Nov. 7, 1975, 46281/75
Int. Cl.² E01B *9/30*
U.S. Cl. 238—349 **12 Claims**



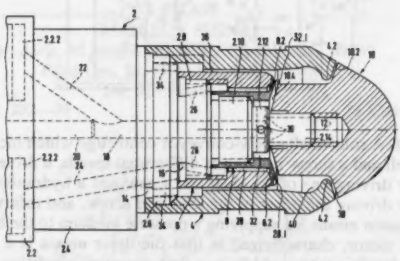
1. A railway rail-fastening clip comprising a rod of resilient metal with a length less than 18 times its thickness which has been bent so as to have, progressing from one end of the rod to the other end, a first portion which starts at said one end of the rod and is a substantially straight leg, then a second portion, then a third portion, then a fourth portion and finally a fifth portion which ends at said other end of the rod, these portions being such that, when the clip is in a particular position, the lowermost points on the opposite ends of the first portion are in the same horizontal plane as one another and the lowermost points on the third and fifth portions are in the same horizontal plane as one another, and the second portion, proceeding from the first portion to the third portion, has a rising part followed by a falling part and when the clip is viewed from above the third and fifth portions appear to be on opposite sides of the axis of the first portion and when the clip is viewed in a horizontal direction parallel to a straight line passing through the lowermost points on the opposite ends of the first portion, said rising part of the second portion is seen to be inclined to the horizontal by, everywhere, less than 45°.

4,073,436

MIXING AND/OR DISPERSING AND SPRAYING ARRANGEMENT

Hans Behr, Lenzhalde 82, 7000 Stuttgart, Germany

Filed Apr. 22, 1976, Ser. No. 679,377
Claims priority, application Germany, Apr. 22, 1975, 2517715
Int. Cl.² B05B *7/00*
U.S. Cl. 239—8 **46 Claims**



1. An arrangement for mixing and/or spraying and dispensing a multi-component fluid material through a nozzle means, the arrangement comprising:

at least one bore means arranged in the nozzle means and exclusively associated with a single component of the multi-component fluid material for directing a flow of the

respective components of the multi-component fluid material in the nozzle means,

annular chamber means for exclusively receiving and accommodating a single component of the multi-component fluid material, said bore means for the respective components of the multi-component fluid material terminating in a respective annular chamber means,

at least one annular dispersion and mixing chamber means for receiving and accommodating the respective components of the multi-component fluid material,

approximately radially extending discharge passage means for discharging the respective components from the respective annular chamber means to said dispersion and mixing chamber means,

means extending axially of the nozzle means for directing a dispersing medium into the dispersion and mixing chamber means to transform the components therein into at least one of a mist and aerosol, and

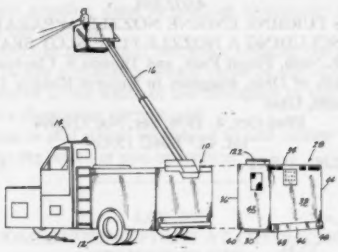
an essentially radial annular discharge means communicating with said dispersion and mixing chamber means for discharging the fluid material from said dispersion and mixing chamber means.

4,073,437

CONVERSION PACKAGE FOR AIRCRAFT DE-ICING MACHINES

Walter Edmond Thorton-Trump, 108 Beaver Lake, Plattsmouth, Nebr. 68048

Filed June 11, 1976, Ser. No. 695,081
Int. Cl.² B60S 3/00
U.S. Cl. 239—131 **10 Claims**



1. A conversion unit for an aircraft deicing apparatus of the type having a wheeled frame means with forward and rearward ends, an aerial platform means on said frame means, a first tank on said frame means, a second tank on said frame means, first pump means fluidly connected to said first tank and a nozzle on said aerial platform means, whereby fluid under pressure can be sprayed onto the aircraft, said conversion unit comprising:

conversion unit frame means for attachment to the rearward end of the wheeled frame means;

heater means on said conversion frame means, said heater means being in fluid communication with said first tank and first pump means;

first conduit means communicating said first tank with said heater means, said first pump means and said nozzle;

second pump means for pumping fluid from said second tank;

proportioning valve means communicating said second pump means with said nozzle, said proportioning valve means being adapted to vary the amount of fluid from said second tank that is sprayed from said nozzle with the fluid from said first tank;

second conduit means communicating said second tank with said second pump means, said proportioning valve and said nozzle; and,

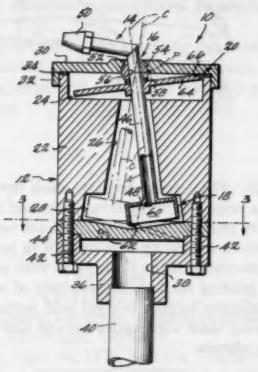
purging means associated with said second conduit means and said first conduit means for selectively circulating fluid from said second tank throughout said first conduit means, said purging means introducing said fluid into said first conduit means at a location intermediate said first pump means and said first tank.

4,073,438

SPRINKLER HEAD

Larry P. Meyer, Walla Walla, Wash., assignor to Nelson Irrigation Corporation, Walla Walla, Wash.

Filed Sept. 3, 1976, Ser. No. 720,395
Int. Cl.² B05B 3/04
U.S. Cl. 239—227 **23 Claims**



1. A sprinkler head comprising;

a stationary sprinkler body structure defining an inlet adapted to be connected with a source of water under pressure and a water-tight chamber communicating with said inlet;

a movable water distributing structure providing inlet means and spaced discharge nozzle means in flow communication relation therewith,

ball and socket connecting means for (1) mounting said water distributing structure on said sprinkler body structure with said inlet means within said chamber and said discharge nozzle means exteriorly of said chamber for (a) rotational movement about a generally upright axis and (b) orbital movement in which the rotational axis of said water distributing structure describes a pair of cones whose apexes join at a point coinciding with the center of said ball and socket connecting means, and (2) providing a water-tight seal for said chamber between said sprinkler body structure and said water distributing structure in any position of movement thereof,

means within said chamber operable in response to the flow of water from said sprinkler body structure inlet to said discharge nozzle means for effecting the aforesaid orbital movement of said water distributing structure, and

means acting between said water distributing structure and said sprinkler body structure for effecting a fractional rotational movement of said water distributing structure during each orbital movement thereof.

4,073,439

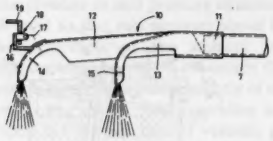
METHOD AND APPARATUS FOR PNEUMATICALLY SPREADING PARTICULATE SUBSTANCES

Xavier Roger Grataloup, Montereau, France, assignor to Societe Anonyme Dite: Nodet-Gougis, Montereau, France

Filed Apr. 12, 1976, Ser. No. 675,927
Claims priority, application France, Apr. 14, 1975, 75 11568
Int. Cl.² A01C 15/04
U.S. Cl. 239—655 **6 Claims**

1. A pneumatic spreading apparatus for a particulate sub-

stance for treating the ground, said apparatus comprising a hopper for the particulate substance, a source of compressed air connected to said hopper and providing a blown stream of the particulate substance, a plurality of tubes connected to said hopper and conveying a flow of the blown stream of the particulate substance to distribution points spaced axially with respect to said tubes, said tubes having outlet ends remote from said hopper, and flow control means at the outlet end of each tube for dividing the flow of the particulate substance into



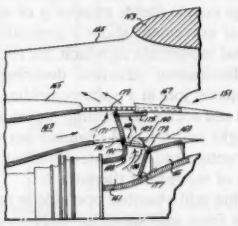
several axially off-set separate parts, each flow control means comprising a nozzle defining flow paths and having a portion secured to its associated tube and at least two separate flow guiding surfaces extending side-by-side in positively stepped relation transversely of the flow paths with adjacent portions of said two guiding surfaces transversely of said nozzle being spaced at different lengths beyond said portion, said guiding surfaces having their extremities curved towards the ground and forming elbows.

4,073,440

COMBINATION PRIMARY AND FAN AIR THRUST REVERSAL CONTROL SYSTEMS FOR LONG DUCT FAN JET ENGINES

Donald W. Hapke, Issaquah, Wash., assignor to The Boeing Company, Seattle, Wash. and Aeritalia S.p.A., Naples, Italy, part interest to each

Filed Apr. 29, 1976, Ser. No. 681,398
Int. Cl.² F02K *3/06*
U.S. Cl. 239—265.29 **17 Claims**



1. A combination primary and fan air thrust reversal control system for a long duct fan jet engine assembly adapted to emit fan air and primary air and including a fan air duct and a primary air duct, said combination primary and fan air thrust reversal control system comprising:

fan air control means for controlling the flow of fan air between a fan air duct exhaust nozzle formed by the aft portion of said fan air duct and a plurality of cascade vanes mounted in a fixed position in a nacelle defining the outer wall of said fan air duct, said nacelle being split such that said fan air duct exhaust nozzle is translatable along the longitudinal axis of said fan jet engine assembly, the axial position of said fan air duct exhaust nozzle controlling the exposure of said plurality of fixed position cascade vanes to said fan air, said fan air control means including said fan air duct exhaust nozzle and a fan air duct blocker door coupled to said fan air duct exhaust nozzle in a manner such that the rearward translation of said air duct exhaust nozzle moves said fan air duct blocker door from a fan air duct open position to a fan air duct closed position;

primary air control means for controlling the flow of primary air between a primary air duct exhaust nozzle formed by the aft portion of said primary air duct and a region of said fan air duct located generally between said fan air duct exhaust nozzle and said plurality of cascade vanes; and,

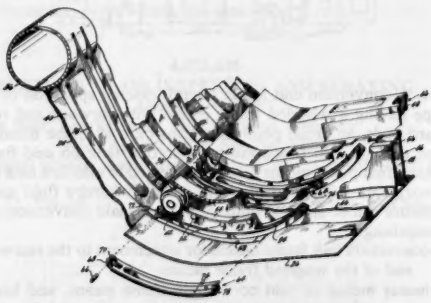
mechanical coupling means for coupling said primary air control means to one of said fan air duct exhaust nozzle and said fan air duct blocker door such that said fan air control means and said primary air control means simultaneously control the flow of fan air between said fan air duct exhaust nozzle and said fixed cascade vanes and the flow of primary air between said primary air duct exhaust nozzle and said region of said primary air duct, respectively, as said fan air duct exhaust nozzle is translated along the longitudinal axis of said fan jet engine assembly.

4,073,441

GAS TURBINE ENGINE NOZZLE APPARATUS INCLUDING A NOZZLE FLAP SLOT SEAL

Dudley O. Nash, Forest Park, and Thomas S. Clayton, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Oct. 4, 1976, Ser. No. 729,594
Int. Cl.² B64C *15/06*
U.S. Cl. 239—265.41 **10 Claims**



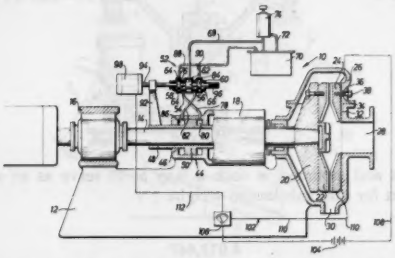
1. In a variable geometry jet nozzle including a pair of articulated flaps arranged in overlapping sliding axial relationship to partially define a fluid flow path and wherein the overlapped flap includes an axially extending slot partially covered by and receiving a portion of the overlapping flap, the improvement comprising seat means associated with the overlapped flap and mounted substantially parallel to the slot, seal means mounted on the overlapping flap for carriage therewith in the substantially axial direction, and connecting means for permitting said seal to float in the vertical direction with respect to the overlapping flap to provide positive seating between the seal means and seat means, and wherein the seal means is slidingly received within the uncovered portion of the slot and is so contoured as to further define the flow path and minimize leakage therethrough.

4,073,442

ELECTRICALLY CONTROLLED SYSTEM FOR REGULATING THE GRINDING SPACE IN A GRINDING APPARATUS

Nils G. Virving, Vallingby, Sweden, assignor to Defibrator Aktiebolag, Stockholm, Sweden

Continuation of Ser. No. 670,359, March 25, 1976, abandoned.
This application Apr. 8, 1977, Ser. No. 786,115
Claims priority, application Sweden, Apr. 7, 1975, 7503967
Int. Cl.[2] B02C 7/14
U.S. Cl. 241—37 7 Claims



1. A system for measuring and regulating the interspace between a pair of relatively rotating metallic grinding discs in grinding apparatus for grinding fibrous cellulosic material, comprising:

(a) an electric circuit having its terminals connected to one of said grinding discs at portions electrically insulated from one another;

(b) conductive cell in said interspace bridging the terminals and having a resistance which varies in accordance with variations in the width of the interspace to thereby produce a fluctuating current; and

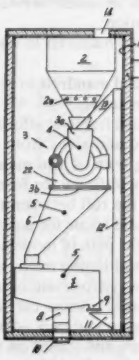
(c) means in said circuit responsive to said current for measuring the width of said interspace.

4,073,443

COMMINUTING PLANT AT CRYOGENIC TEMPERATURES

Francesco Danioni, Milan, Italy, assignor to Italo Danioni S.d.f. and Sio-Societa' per l'Industria dell'Ossigeno e di Altri Gas S.p.a., both of, Italy, part interest to each

Filed Feb. 14, 1977, Ser. No. 768,570
Claims priority, application Italy, Feb. 16, 1976, 20192/76
Int. Cl.[2] B02C 23/12
U.S. Cl. 241—65 7 Claims



1. A plant for comminuting materials that are difficult to comminute at room temperature, comprising:

means defining a closed enclosure having heat insulated walls;

a charging hopper in said enclosure and a charging opening in said enclosure for directing feed material into said hopper;

comminuting means in said enclosure positioned to receive material from said hopper and further means in such enclosure for directing ground material from said comminuter out of said enclosure;

means for directing a cryogenic liquid onto material in said comminuter and additional means for freely releasing cold gas from said comminuter and further means into said enclosure to maintain a refrigerated atmosphere therein; and

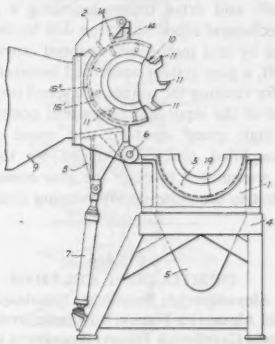
controllable release means for releasing gas from said enclosure at a selected controlled rate to maintain a predetermined temperature and pressure in said enclosure and the means therein.

4,073,444

CUTTING MILL

Jarmil Pav, Reutlingen, Germany, assignor to Bruderhaus Maschinen GmbH, Reutlingen, Germany

Filed Sept. 30, 1976, Ser. No. 728,116
Claims priority, application Germany, Oct. 4, 1975, 2544496
Int. Cl.[2] B02C 18/22
U.S. Cl. 241—73 7 Claims



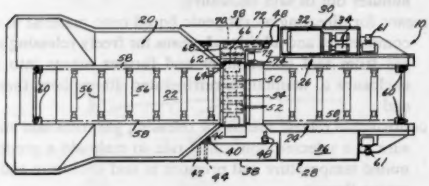
1. A cutting mill comprising a housing having upper and lower parts forming a cutting chamber, a rotor rotatably mounted in the upper housing part on an axis, said rotor having cutting blades mounted thereon arranged in a cylindrical surface defining a circumference of flight of the rotor blades, stator cutting blades mounted in said housing and operatively cooperating with said rotor blades, a sieve removably mounted in the lower housing part, means pivotably mounting said upper and lower housing parts about an axis substantially parallel to the rotor axis, said upper and lower housing parts being pivotable relative to each other between an operating position and an open position, whereby, when said housing parts are relatively pivoted to the open position, the lower housing part is accessible for removal and replacement of the sieve and including spacing means mounted in the upper housing part for spacing the sieve a predetermined radial gap from the rotor blade circumference of flight when said upper and lower housing parts are pivoted to said operating position, said spacing means including arcuate stop surfaces extending radially beyond the circumference of flight of the rotor blades.

4,073,445

FEEDER CRUSHER

David Clonch, Tazewell, Va., assignor to S & S Corporation, Cedar Bluff, Va.

Filed Dec. 1, 1976, Ser. No. 746,819
Int. Cl.[2] B02C *13/30*
U.S. Cl. 241—101.7 2 Claims



1. A feeder-crusher machine for use in low clearance mines comprising an elongated low-profile body supported from the ground on traction means so as to be movable along the ground longitudinally, said body having side walls and a bottom and including, in end-to-end relationship along the length of the machine, a receiving section, a crushing section and a discharge section; said crushing section including a rotary crusher shaft mounted transversely in said body and carrying a plurality of radial breaker arms the outer ends of which define a circle spaced from a wall of the machine; means for urging material residing on said bottom in said receiving section to the space between said circle and said wall so as to be crushed therein and for urging the resulting crushed material along the discharge section in a direction away from said crusher section; and drive means mounted on said body for rotating said crusher shaft, said drive means including a constant-speed motor, a mechanical speed reduction unit having a high speed input driven by said motor, a low speed output driving said crusher shaft, a gear system connected between the input and the output for rotating the output at a speed proportional only to the speed of the input and a flywheel connected to rotate with said high speed input to said speed reduction unit whereby amplified torque produced by the high speed flywheel is transmitted through the gear connections in said reduction unit to the more slowly rotating crusher shaft.

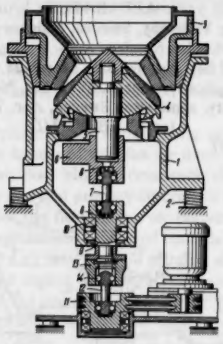
4,073,446

INERTIA CONE CRUSHER

Konstantin Alexandrovich Rundkvist, Shkolnaya ulitsa, 6, kv. 23; Nikolai Alexeevich Ivanov, Novoizmailovsky prospekt, 19, kv. 96; Boris Gavrilovich Ivanov, Basseinaya ulitsa, 5, kv. 18; Leonid Petrovich Zarogatsky, Uglovoi pereulok, 5, kv. 21; Evgeny Sergeevich Mitrofanov, ulitsa Sedova, 69, kv. 30, and Ilya Izrailevich Blekhman, prospekt Kosmonavtov, 46, korpus 1, kv. 194, all of Leningrad, U.S.S.R.

Filed Aug. 13, 1976, Ser. No. 714,257
Claims priority, application U.S.S.R., Sept. 23, 1975, 1422777
Int. Cl.[2] B02C *2/04*
U.S. Cl. 241—207 4 Claims

1. An inertia cone crusher comprising: a shell; vibration dampers adapted for connecting said shell with a base; a crushing bowl mounted in the top portion of said shell for receiving material to be fed therein for crushing same; a breaking head with a cantilevered shaft extending downwardly, said breaking head being mounted in said crushing bowl for crushing the material entering the bowl; an unbalanced weight set on said cantilevered shaft of the breaking head; a rotation drive for said unbalanced weight having a driving member disposed on the base under said shell coaxially with the latter, a countershaft mounted under said unbalanced weight in the bottom portion of said shell coaxially with the latter, a flexible connection for connecting the lower end of said countershaft with said driving member, and a ball spindle intended for connecting the upper end of said countershaft with said unbalanced



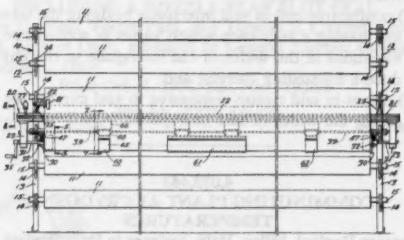
weight and mounted in such a way as to serve as an axial support for said unbalanced weight.

4,073,447

ROLL FORMING, MEASURING AND CUTTING APPARATUS

Francis P. Wrenn, 128 St. Andrews Court, Mount Laurel, N.J. 08054

Filed Dec. 8, 1976, Ser. No. 748,692
Int. Cl.[2] B65H *19/26, 17/06*
U.S. Cl. 242—56 R 20 Claims



1. Apparatus for forming a roll of material from another roll of material mounted to rotate about a stationary axis in a roll rack, said apparatus comprising:

a frame having an elongated base member and a pair of arms extending outwardly from opposite ends of said base member;

a pair of mandrels mounted between said arms in spacec confronting relation;

means mounting said mandrels to said arms to rotate about a common axis;

means carried by said mandrels to releasably grip a marginal portion of the material;

means carried by said frame to afford axial movement of said mandrels toward and away from one another;

means for rotating both of said mandrels about their axes;

means carried by said frame for forming material into a roll and supporting the roll between the mandrels;

means carried by said frame for positoning said base member transversely to the path of movement of material onto said mandrels, said positioning means including a pair of hangers extending away from said base member in a direction opposite said arms, means carried by said hangers for releasably engaging said rack adjacent the ends of the roll supported therein, and means on said frame for cooperating with said rack and said hangers to releasably support said frame so that said arms extend outwardly of said rack; and

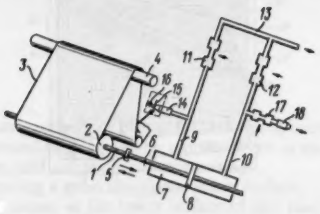
a cutting assembly moveable along said base member for severing the material.

4,073,448

AUTOMATIC DEVICE FOR FIXING THE EDGE OF A MOVING BAND

Ivan Alexandrovich Kolosov, ulitsa Astrakhanskaya, 118, kv. 54, Saratov, U.S.S.R.

Filed Sept. 9, 1976, Ser. No. 721,708
Claims priority, application U.S.S.R., Sept. 10, 1975, 2172470
Int. Cl.[2] B65H *25/26*
U.S. Cl. 242—57.1 5 Claims



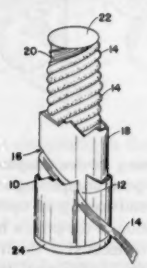
1. An improved device for fixing the edge of a moving band or web of sheet material employing a system of compressed gas supply and a roll holder adapted to feed said band over at least one bar, comprising: a band cross-traverse mechanism including a double-acting air cylinder having a piston and rod coupled to said roll holder and having a pair of opposite chambers in communication with said compressed-gas supply through associated pipings; throttle valves provided in each of said pipings; at least two nozzles, each being connected through its inlet to one of said pipings and each being located between one of said throttle valves and one of the chambers of said air cylinder, thus ensuring a uniform gas discharge simultaneously from both chambers of said air cylinder; and at least one of said nozzles having a closure or band edge position detector means adapted to interact with the edge of said band and being adapted to effect control over the operation of said air cylinder; whereby the edge of said bands or web is automatically maintained in a desired fixed position by said band cross-traverse mechanism which shifts or displaces said roll holder due to to variations in the pressure in said chambers of said air cylinder.

4,073,449

APPLIANCE CORD REEL

Joseph Pilat, 69-29 54th Ave., Maspeth, N.Y. 11378

Filed May 19, 1976, Ser. No. 687,937
Int. Cl.[2] B65H *75/48*
U.S. Cl. 242—107.1 5 Claims



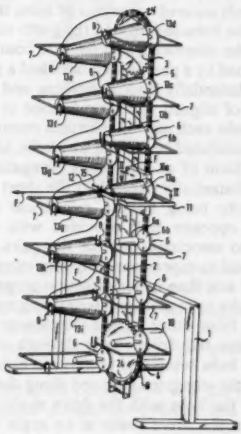
1. An appliance cord reel comprising cord mounting means for distributing turns of said cord in touching engagement to adjacent turns of said cord about an external surface of said cord mounting means, cord distributing means for disposing selective portions of said cord about said surface, housing means enclosing said cord distributing means and said cord mounting means, said cord passing through an opening in said housing means terminating in a receptacle and passing through another opening in said housing means terminating in a plug, said receptacle extending outwardly from said opening and biased inwardly by spring bias means acting upon said cord mounting means, said cord distributing means including a hollow right angle cylinder, said hollow right angle cylinder housing a spirally wound slot located in the cylindrical surfaces thereof, said slot extending substantially along the entire length of said hollow right angle cylinder and having an angular displacement about the longitudinal axis of said hollow right angle cylinder limited to a maximum of 360°, said longitudinal axis of said hollow right angle cylinder co-axially aligned with the longitudinal axis of said external surface of said cord mounting means, said cylindrical surfaces of said hollow right angle cylinder being disposed rotatable about the longitudinal axis thereof relative to said external surface of said cord mounting means.

4,073,450

DEVICE FOR HOLDING YARN BOBBINS

Eric Carlsson; Karl Ivan Gefvert; Thomas Hjalmarsson; Anton Kerff; Karel Pejchal, and Lars Wide, all of Ulricehamn, Sweden, assignors to Aktiebolaget IRO, Ulricehamn, Sweden

Filed Sept. 14, 1976, Ser. No. 723,196
Claims priority, application Germany, Sept. 15, 1975, 2541051; May 21, 1976, 2622989
Int. Cl.[2] B65H *49/02;* D02H *1/00;* D03J *5/08*
U.S. Cl. 242—131 20 Claims



1. In a device for holding yarn bobbins and having at least two bobbin supports each for holding one bobbin, whose thread ends are tied together to permit them to unwind in succession without interruption, and a stationary thread eye which has a specific association with respect to the bobbin which is unwinding at any given moment, the improvement comprising a movable transport device on which more than two bobbin supports are mounted and are movable in common such that the respective bobbin to be unwound can be brought into an unwinding position having a required association with respect to the stationary thread eye, motor means connected to the transport device for moving same, and a thread scanning device provided adjacent the thread as unwound from the bobbin located in said unwinding position for detecting the thread as it jumps from the bobbin just emptied to the next bobbin, means connecting the thread scanning device with the motor means such that, when the thread scanning device detects the unwound thread jumping to the next bobbin, the

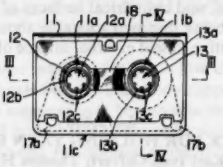
motor means is energized to move the transport device to such an extent that the next bobbin is moved into the unwinding position so as to have the required association with respect to the stationary thread eye.

4,073,451

TAPE CASSETTE

Masaaki Sato, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 577,903, May 15, 1975, abandoned. This application Feb. 15, 1977, Ser. No. 768,854
Claims priority, application Japan, Jan. 6, 1975, 50-4324
Int. Cl.[2] B65H *59/38*; G03B *1/02*; G11B *15/13, 15/32*
U.S. Cl. 242—191 **18 Claims**



1. A tape cassette for use in a tape recorder having a pair of hub supporting shafts extending upwardly from a cassette mounting plate, said tape cassette comprising a cassette containing at least one guide roller; a pair of tape hubs rotatably disposed within the cassette at positions which are offset at opposite sides from the center thereof; a magnetic tape having its opposite ends secured to the pair of hubs, the tape extending from one of the hubs and around the guide roller before being taken up on the other hub; said cassette comprising front and rear walls joined by a pair of long sides and a pair of short sides defining a substantially hollow housing and having first and second pairs of aligned apertures formed in the walls of the cassette wherein each pair of apertures receives and rotatably supports an associated one of the tape hubs, all of the apertures being in the form of an elliptically elongated slot having its major axis substantially parallel to the short sides of the cassette; said hubs being hollow cylindrical shaped members having their opposite ends provided with ribs respectively extending into associated ones of the pairs of openings and thereby adapted to experience more movement in the direction of said major axis than in the direction perpendicular thereto; the hubs and the pairs of openings enabling rotation of the hubs to be viewed from either wall of the cassette and enabling the hubs to receive the drive shafts through either wall of the cassette, said hubs being free to move in either direction from the center of the elongated slots and along the associated major axes to align the hubs with the drive shafts as the cassette is lowered upon the drive shafts at an angle to said mounting plate, and being adapted to return to the centers of the elongated slots once the drive shafts are fully inserted into the hubs and the cassette is substantially parallel to said mounting plate.

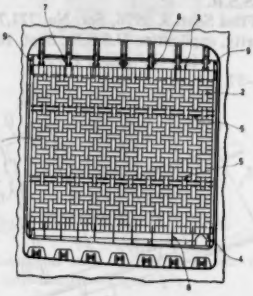
4,073,452

APPARATUS FOR DELAYING THE PRESSURE DROP IN PRESSURIZED CABINS OR THE LIKE ESPECIALLY IN AN EMERGENCY

Dieter Gosau, Hamburg, Germany, assignor to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung, Munich, Germany

Filed July 30, 1976, Ser. No. 710,344
Claims priority, application Germany, Aug. 14, 1975, 2536231
Int. Cl.[2] B64D *45/00*
U.S. Cl. 244—118 R **19 Claims**

1. An apparatus for delaying the pressure drop due to an explosive decompression in a pressurized aircraft cabin structure, having a door opening therein and door means including a locking mechanism for closing said door opening, following a failure in the locking mechanism said door opening being defined by respective structural elements forming part of said cabin structure, said apparatus comprising air permeable mat means having a defined air permeability, and means for removably securing said mat means to said structural elements defining said opening to cover said opening in addition to said door, said mat means comprising upper and lower edges as well as



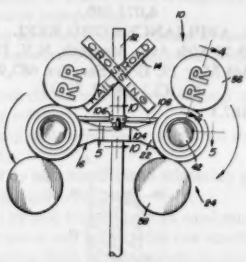
said edges, said securing means comprising means connecting said upper and lower edges of said mat means in a force transmitting manner to said opening defining structural elements whereby the mat means are capable of taking up forces effective on the cabin structure when a pressure drop occurs, said mat means further comprising a plurality of belts, said securing means comprising a plurality of connecting members for connecting said belts to the cabin structure.

4,073,453

RAILROAD WARNING SIGNAL DEVICE

Marion V. Thomas, 545 Thornwood Drive, Baton Rouge, La. 70806

Filed May 12, 1977, Ser. No. 796,471
Int. Cl.[2] B61L *29/24*
U.S. Cl. 246—125 **11 Claims**



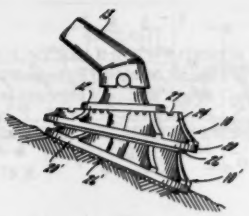
10. A visual warning device adapted to be mounted on a vertically elongated post, comprising a frame extending transversely of the post and having an opening formed therein in laterally spaced relation to the post, a hub having a light emitting surface, means connected to the frame in peripheral relation to said opening for fixedly mounting the hub to establish a rotational axis extending through the opening and intersecting said light emitting surface, and movable alerting means mounted on the hub for rotation about said rotational axis in surrounding relation to the light emitting surface.

4,073,454

OUTRIGGER PAD

Charles J. Sauber, 10 N. Sauber Road, Virgil, Ill. 60182

Filed July 26, 1976, Ser. No. 708,408
Int. Cl.[2] F16M *11/24*
U.S. Cl. 248—188.2 14 Claims



1. An outrigger pad for placement between an outrigger foot and the ground to improve the support given to an outrigger mechanism, said outrigger pad comprising:

a base having a generally planar lower surface;

gripping means on the lower surface of said base for penetrating the ground to a short distance when force is applied from above, thereby restricting lateral movement of the outrigger pad over the ground contacted by said gripping means;

a plurality of raised ribs on the upper surface of said base, said ribs having upper edges lying substantially in a plane that defines an oblique angle with respect to the lower surface of said base;

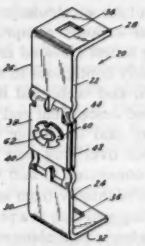
said ribs having interfitting means for receiving said gripping means on the lower surface of another outrigger pad of like construction, so that a plurality of outrigger pads of like construction can be interfittingly stacked, one on top of another, and restricted from lateral motion with respect to one another.

4,073,455

TILTABLE BRACKET

Conrad J. Gunther, Uniondale, N.Y., assignor to Dzus Fastener Co., Inc., West Islip, N.Y.

Filed Oct. 5, 1976, Ser. No. 729,683
Int. Cl.[2] A47F *5/00*
U.S. Cl. 248—291 8 Claims



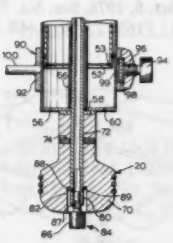
1. A tiltable bracket comprising; a first elongated member and a second elongated member, the members being pivotally interconnected, means for restraining the members in a position with their respective longitudinal axes aligned, means for permitting the relative pivoting of the members a predetermined angular distance, and stop means to prevent further pivoting beyond the predetermined angular distance without restricting return of the members to the position with their longitudinal axes aligned, a shoulder projecting from the surface of one bracket member into engagement with the leading edge of the other bracket member when the bracket members are aligned axially in the longitudinal direction so as to prevent angular pivoting between the bracket members in one direction, a projection formed on the surface of one of the bracket members and extending therefrom in position to engage with the leading edge of the other bracket member and restrain relative movement of the bracket members in the opposite angular direction when the members are axially aligned in the longitudinal direction, and a stop tab extending from the surface of one of the bracket members and spaced from the projection thereon so that when sufficient force is applied to the bracket members so that relative angular movement occurs with the leading edge of the one bracket member extending over the projection on the other bracket member, the angular movement will be permitted until the leading edge contacts the stop tab whereupon further angular movement in the opposite direction is prevented, the tab, projection and shoulder being positioned so that the bracket members can be returned to the axially longitudinally aligned position with the leading edge of the one bracket member passing again over the projection and being restrained from further movement in that direction by engagement with the shoulder.

4,073,456

SUSPENSION SUPPORT

Alexander Donald Karapita, 44 Lyme Regis Cres, Scarborough, Ontario, Canada, and James Douglas Orr, Toronto, both of Canada, assignors to Alex D. Karapita, Scarborough, Canada

Filed July 14, 1976, Ser. No. 706,107
Int. Cl.[2] B42F *13/00*; A47B *1/06*
U.S. Cl. 248—337 17 Claims



1. A suspension support comprising:

a vertical cylinder having an upper end closure with a port therein connectable to a vacuum source;

a piston slidable in the cylinder and forming, with the upper end closure, a closed chamber;

means selectively actuable to brake the piston within the cylinder;

valve means selectively operable to vent the chamber;

a handle positioned outside the cylinder and connected to the piston;

means connected with the handle to support an object; and

means on the upper end of the cylinder to mount the support.

4,073,457

ARTICLE SUSPENSION DEVICE

John H. Batts, Grand Rapids, and Everett L. Duester, Holland, both of Mich., assignors to John Thomas Batts, Inc., Zeeland, Mich.

Continuation-in-part of Ser. No. 647,731, Jan. 9, 1976. This application Apr. 28, 1976, Ser. No. 681,233
The portion of the term of this patent subsequent to May 17, 1994, has been disclaimed.
Int. Cl.[2] A44B *17/00*; B42F *13/00*
U.S. Cl. 248—340 6 Claims

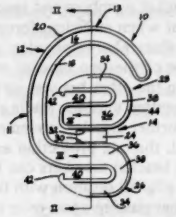
1. An article suspending device, comprising:

a support hook;

a spacer member connected to said support hook;

a pair of wing members, each wing member being connected

to a lateral edge of said spacer member and each of said wing members defining a generally tear-shaped slot having a reduced neck area and opening through one end of each of said wing members, said support hook, said spacer member and said wing members being molded from a resilient, resinous material; and



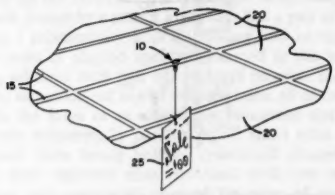
first hinge means integral with an end of said spacer member and with said support hook for hingedly connecting said support hook to said spacer member and wherein said tear-shaped slots open in a direction towards said support hook.

4,073,458

HANGER CLIP FOR DISPLAYING ARTICLES FROM SUSPENDED CEILINGS

True F. Sease, 10491 Air Hill Road, Brookville, Ohio 45309

Filed Oct. 5, 1976, Ser. No. 729,671
Int. Cl.[2] F16M *13/00*; A44B *17/00*
U.S. Cl. 248—340 **7 Claims**



1. A hanger clip for displaying an article from a suspended ceiling of the type which includes a plurality of ceiling panels installed on overhead beams each having a horizontal flange and a vertically upright leg, the clip comprising

a continuous thin elongated strip including

means defining a U-bend portion located generally centrally of said strip having a depth at least sufficient to receive that part of the horizontal flange extending on one side of the vertical leg of the overhead beam,

a vertically downwardly extending portion including means on the lower end thereof for holding an article for display, and

a vertically upright portion adapted to be placed between the vertically upright leg of the overhead beam and the ceiling panel for holding said hanger clip securely in place.

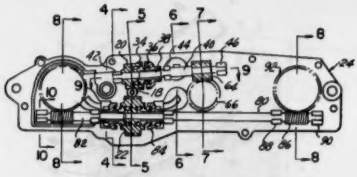
4,073,459

SIX-WAY ADJUSTABLE SEAT SUPPORT

Joseph Pickles, Birmingham, Mich., assignor to Ferro Manufacturing Corporation, Detroit, Mich.

Filed Mar. 10, 1976, Ser. No. 665,536
Int. Cl.[2] F16M *11/12*
U.S. Cl. 248—394 **6 Claims**

1. An elongated transmission support body formed in its entirety of integral injection molded plastic having at one side thereof an integral rigid tubular lateral extension for the reception of a main drive shaft, a plurality of sets of pairs of parallel spaced lift and traverse shaft support arms extending laterally from the other side of said body, said arms being substantially rigid, the junction of said arms and said support body providing for movement of the free ends of the arms of a pair toward and away from each other, cylindrically formed confronting recesses adjacent the free ends of said arms to receive and



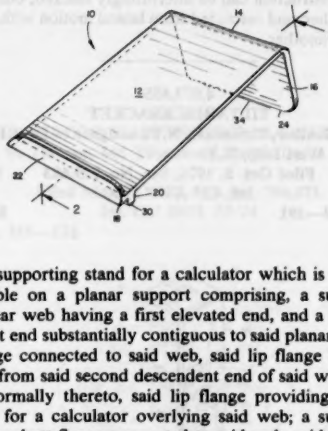
rotatably support the end portion of a shaft, means for supporting end thrust of said shaft comprising a steel disc supported between the arms of one of said pairs and engaging the end of said shaft, and a cover including a pocket in which the free ends of said arms are received, said cover having an abutment screw extending into the space between said arms and abutting the side of said disc opposite the side engaged by said shaft.

4,073,460

STAND FOR CALCULATOR

Richard Dale, New York, N.Y., assignor to Appollon Designs, Inc., New York, N.Y.

Filed July 21, 1976, Ser. No. 707,267
Int. Cl.[2] A47B *19/00*
U.S. Cl. 248—441 R **1 Claim**



1. A supporting stand for a calculator which is removably mountable on a planar support comprising, a substantially rectilinear web having a first elevated end, and a second descendent end substantially contiguous to said planar support; a lip flange connected to said web, said lip flange issuing upwardly from said second descendent end of said web substantially normally thereto, said lip flange providing a bearing support for a calculator overlying said web; a substantially rectilinear butt flange connected to said web, said butt flange issuing downwardly substantially from said first elevated end of said web, and elevating said web at a predetermined angle of inclination relative to a horizontal plane medianly through said stand of about 45° or less a longitudinally extending rail flange connected to said web, said rail flange underlying substantially said second end of said web, and having respective upper and lower oblique surfaces, said upper oblique surface thereof being fixedly connected to said web, said upper and lower oblique surfaces defining an angle corresponding to the angle of inclination of said web and providing a level mount therefor, said butt flange and said rail flange having respective beveled planar support engaging surfaces, and including cooperating means mounted, respectively, in said beveled planar support engaging surfaces of said butt flange and said rail flange, for rendering said stand substantially skid resistant on said planar support, said means comprising a corresponding longitudinally

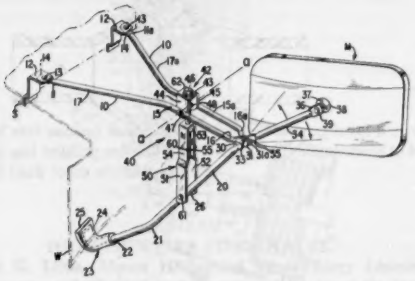
elongated recess in each of said beveled planar support engaging surfaces provided in said butt flange and said rail flange, and a felt strip mounted in each of said recesses spaced from the side walls of said recesses to provide a clearance therebetween, each of said felt strips extending past the mouth of its respective recess to abut a planar support surface on which said stand is mounted.

4,073,461

FENDER-MOUNT REAR VIEW MIRROR SUPPORT

Manuel Lopez, Trumbull, Conn., and Bernard C. Sharp, White Plains, N.Y., assignors to Parker-Hannifin Corporation, Shelton, Conn.

Filed Mar. 4, 1977, Ser. No. 774,332
Int. Cl.[2] B60K *1/06*
U.S. Cl. 248—475 R **9 Claims**



1. A support for mounting a rear view mirror on a vehicle fender, comprising a pair of arms spaced apart laterally at their inner ends and adapted to protrude outwardly from the fender, said inner ends each having means thereon for engaging with a top portion of the fender, a leg adapted to extend outwardly and upwardly from and having means on its inner end for engaging with a bottom portion of the fender, means at a junction of respective outer end portions of the arms and leg for interconnecting the same pivotably, means for supporting a mirror from said junction, and coupling means for interconnecting and converging respective intermediate portions of said pair of arms and said leg so as to clamp said engaging means tightly against the fender, said coupling means including a bracket member having a centrally apertured base portion adapted to be disposed above said arms and leg portions fastened respectively to respective intermediate portions of said arms, a saddle member having leg portions straddling and fastened pivotably to said intermediate portion of said leg, a retainer held in said saddle member, and an elongate rigid coupling element adapted to extend through the aperture in said base portion for engagement with said retainer, said coupling element having a head held above said base portion and by which it is displaceable relative to said retainer for either clamping said engaging means tightly against the fender or releasing the same therefrom.

4,073,462

SUPPORT DEVICE

Edward Whitaker, Box 11284, Cincinnati, Ohio 45211

Filed June 24, 1975, Ser. No. 589,868
Int. Cl.[2] A01K *97/10, 97/12;* **F16B** *47/00*
U.S. Cl. 248—537 **19 Claims**

1. A support device comprising:

a base which includes a plurality of attaching means for releasably connecting said base to a supporting surface, said attaching means each being connected to said base to form a triangle having a geometric center;

a support rod having an elongate body and being connected at one end thereof to said base adjacent said geometric center and extending outwardly from said base, said rod body being bent at the other end thereof into an S-shape which includes a first loop adjacent said rod body and having an open portion presented toward said base and a second loop remote from said rod body having an open portion presented away from said base;

said rod being inclined with respect to said base so that said second loop is located in vertical alignment with said geometric center and said first loop is located between

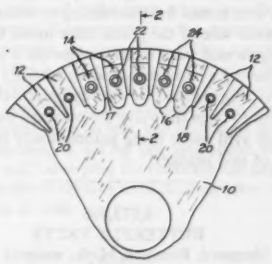
said geometric center and a line connecting two of said attaching means so that force generated by a member bearing against said first loop is essentially evenly distributed via said base among said plurality of attaching means and force generated by a member bearing against said second loop is essentially evenly distributed via said base between said two attaching means.

4,073,463

SPROCKET MOLD

Richard M. Bell, Wells Hill Road, Lakeville, Conn. 06039

Filed June 21, 1976, Ser. No. 697,911
Int. Cl.[2] B29D *15/00*
U.S. Cl. 249—102 **9 Claims**



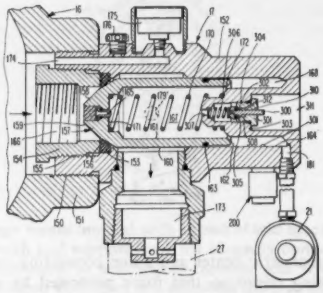
1. A molding system for molding a plurality of different sprockets for operating with a predetermined link diameter, means defining a mold cavity, a plurality of tooth-defining elements adapted to be inserted in the mold cavity, each tooth-defining element having a curved inner end defining the tooth cavity and sides defining the tooth sides, each element side terminating in a shoulder which is tangent to the sprocket tooth outside circumference, a plurality of mold insert plates, each plate being designed to give a different sprocket diameter, each plate having a plurality of element-positioning slots, the number of slots in each plate being different but the arcuate spacing between the inner ends of adjacent slots being identical, a positioning surface associated with each slot, each surface being radially spaced an equal amount from the center of the mold plate.

4,073,464

CYLINDER VALVE FOR GAS FIRE EXTINGUISHING SYSTEM

Arne Hansen, New City, N.Y., and George Troup, Hatboro, Pa., assignors to Chemetron Corporation, Chicago, Ill.

Filed Aug. 24, 1976, Ser. No. 717,279
Int. Cl.[2] F16K *31/383, 31/40*
U.S. Cl. 251—26 **6 Claims**



1. In a cylinder valve of the fluid operative type for use in a fire extinguishing system of the fluid distribution type, wherein the valve includes a moveable piston slideably disposed in a housing, with the housing having a fluid inlet and a fluid outlet and a valve seat therebetween, with the piston normally having a front end disposed against the valve seat in the closed condition of the valve, with a fluid communication port connecting the front of the piston with a cavity at the rear of the piston for facilitating the equalizing of fluid pressure on opposite sides of the piston while the valve is in the closed condition with the piston seated, and with the fluid communication port being sized to prevent rapid fluid flow across the piston, with means being provided for rapidly evacuating the fluid from the cavity at the rear of the piston relative to the flow of fluid through the fluid communication port and for releasing forces on the rear side of the piston that oppose unseating fluid forces on the piston and thereby unseating the piston, the improvement comprising vent means for maintaining a venting of the cavity at the rearward side of the piston after initial unseating of the piston, wherein said vent means comprises a normally closed vent valve having a plunger extending partially into said cavity for operative engagement by said cylinder valve piston upon its movement to open the valve for outward movement of said plunger, said vent valve being automatically openable by said movement of said plunger.

4,073,465

BUTTERFLY VALVE

William L. Sheppard, Romulus, Mich., assignor to AVM Corporation, Jamestown, N.Y.

Division of Ser. No. 490,232, July 22, 1974, abandoned. This application Apr. 25, 1975, Ser. No. 571,533
Int. Cl.[2] F16K *31/126*
U.S. Cl. 251—58 **3 Claims**

1. A valve comprising a valve seat having a passageway therethrough and a valve element movable into and out of engagement with said valve seat for opening and closing said passageway, one of said valve seat or element being formed of an elastomeric material and the other thereof being formed of a relatively rigid material;

actuating means operatively connected to said valve element for moving said valve element to and from a closed position in which said valve element engages said valve seat and said passageway is closed by said valve element;

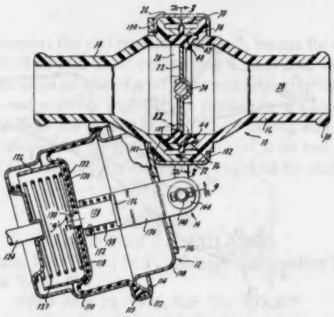
a motor having a fluid responsive diaphragm movable between first and second positions;

a connecting element fixed to and movable with said diaphragm;

an arm having one end slidingly engaging said connecting element for movement in two directions back and forth thereon, and an opposite end connected to said actuating means;

first stop means adjacent said diaphragm and second stop means spaced therefrom for limiting the sliding movement of said arm relative to said connecting element in both said directions; and

a preloaded compression spring operatively disposed between said arm and said second stop means for biasing said arm against said first stop means, whereby movement of said diaphragm to its first position will cause said first stop means to move said arm in a direction to cause said actuating means to move said valve element to its open position, and movement of said diaphragm to its second position will cause said second stop to push against said spring to move said arm in a direction to cause said actuating means to move said valve element to its closed position, with said spring limiting the amount of force which can be exerted by said diaphragm on said valve element in a direction tending to move the latter to said closed position, the preload on said spring and the arrangement of parts being such that on closing said valve element engages said valve seat prior to said diaphragm reaching said second position, whereby said spring is at least partially compressed when said valve is closed, the compession of said spring being sufficient to provide a valve closing force which results in a slight compression of said elastomeric material.



4,073,466

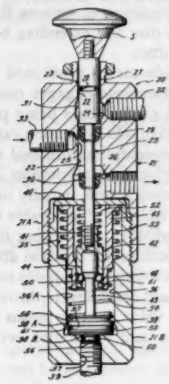
VALVE

David E. Snyder, Longview, Tex., assignor to U.S. Industries, Inc., New York, N.Y.

Filed Mar. 3, 1976, Ser. No. 663,272
Int. Cl.[2] F16K *11/07, 31/122*
U.S. Cl. 251—63.4 **16 Claims**

1. A valve, comprising a body having a bore extending longitudinally therein and lateral ports connecting with the bore at longitudinally spaced locations, a valving element longitudinally reciprocable within the bore between first and second positions for controlling the flow of a first fluid between the lateral ports in each of said positions, said body having a cylinder at one end of the bore and a port therein connecting with the cylinder to receive a second fluid, a piston sealably slidable longitudinally within the cylinder between first and second positions and adapted to be urged by the second fluid toward its first position, a stem on the valving element extending through the other end of the valve body to provide an externally accessible part which may be manipulated to shift the valving element between its first and second positions, and means automatically and solely responsive to manipulation of the stem to shift the valving element from its

second to its first position for holding the valving element in said first position irrespective of the pressure of said second fluid, and means automatically responsive to a rise in the pressure of said second fluid above a predetermined level for releasing said holding means to permit said valving element to be moved back to its second position.

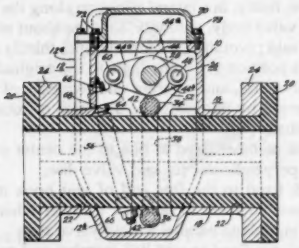


4,073,467

HIGH PRESSURE PINCH VALVE

Robert K. Little, Mount Holly, and Edgar Barry Lincoln, Moorestown, both of N.J., assignors to RKL Controls, Inc., Hainesport, N.J.

Filed June 3, 1976, Ser. No. 692,560
Int. Cl.[2] F16K *7/06*
U.S. Cl. 251—7 **8 Claims**



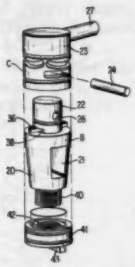
1. A pinch valve comprising a housing, a substantially cylindrical valve body of elastomeric material disposed within said housing, and a valve actuating mechanism on said housing for controlling flow through said valve body by deforming said body, said actuating mechanism including a drive shaft rotatably mounted in said housing perpendicularly to the axis of said valve body and in spaced relation to said valve body, a pair of parallel pinch bars disposed within said housing on opposite sides of said valve body, means on said valve housing for supporting said pinch bars and permitting movement thereof only in a plane perpendicular to said valve body axis and passing through said drive shaft, a pair of crank elements secured in spaced relation to said drive shaft, connecting links pivotally attached to said crank elements and joined to the ends of said pinch bars to produce opposed movement of said pinch bars in said plane upon rotation of said drive shaft, said crank elements being disposed within said housing interiorly of said connecting links, means for rotating said drive shaft through an arc of substantially 90°, said drive shaft when rotated to a first position with the pivot points of said crank arms and connecting links aligned in the same plane with said pinch bars producing a leak tight closure of said valve body and a locking of said actuating mechanism against movement due to line pressures on either side of the valve closure, the rotation of said drive shaft to a position substantially 90° from said first position producing a fully opened condition of said valve body, and means for adjusting the length of a pair of said connecting links to adjust the spacing of said pinch bars in said first position of said drive shaft.

4,073,468

ROTARY PLUG VALVE

Robert L. Erwin, 1702 N. Mesa Verde Ave., Farmington, N. Mex. 87401

Filed Sept. 16, 1976, Ser. No. 724,090
Int. Cl.[2] F16K *31/44*
U.S. Cl. 251—77 **10 Claims**



1. A rotary plug valve comprising a tapered valve plug, valve plug operating means including a rotary and axially movable plug operating head, a valve casing including a tapered valve chamber for receiving said tapered valve plug, said valve chamber having inlet and outlet ports communicating therewith and a first cylindrical extension for receiving said rotary and axially movable plug operating head therein, cam means responsive to rotation of the operating head for imparting axial movement to the head when the head is rotated, said tapered rotary valve plug fitting within said tapered valve chamber and being provided with a transverse for communicating with the inlet and outlet ports when the valve is in open position, first means interconnecting the operating head and valve plug to provide an immediate lifting operation to the plug when the head is rotated to loosen the plug from its seat, said interconnecting means also serving to provide delayed rotation of the plug after initial rotation of the head until the plug has been raised from its seat, and additional interconnecting means comprising a spring pin interposed between the operating head and valve plug for restoring the head and plug to their initial position relative to each other after the plug has been raised from its seat.

4,073,469

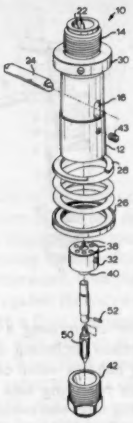
SHUT-OFF VALVE FOR CONTROL OF FLOW OF MOLTEN PLASTIC MATERIAL

Joseph Kodric, Toronto, Canada, assignor to Inventive Plastic Products Ltd., Weston, Canada

Filed Nov. 18, 1976, Ser. No. 742,836
Int. Cl.[2] F16K *25/00*
U.S. Cl. 251—86 **12 Claims**

1. A shut-off valve comprising:
a cylindrical body,
a cylindrical recess formed in one end of said body coaxial with said body,
a diametrically-extending transverse slot formed in said body and elongated axially of said body,
a pin located in and extending through said slot,
means normally biasing said pin towards said one end of said body to space said pin from the end thereof remote from said one end,

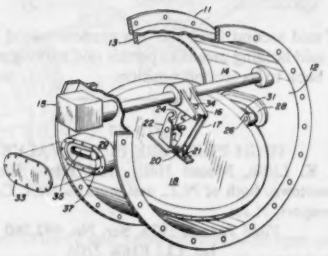
an axial passageway extending between said recess and said slot,
an inlet at the other end of said body,
passage means extending from said inlet to said recess out of fluid flow communication with said slot other than through said axial passageway for conveying liquid material from said other end to said recess,
cylindrical insert means positioned in said recess,
said insert means having an axial bore aligned with said axial passageway and a plurality of equally arcuately spaced bores radially located with respect to and parallel to said axial bore,
means establishing fluid flow communication between the downstream end of said passage means and the upstream end of said plurality of bores,
closure means in said one end of said body,



said closure means having an orifice located on the axis of said body and passage means establishing fluid flow communication between said orifice and said downstream end of said plurality of bores, whereby fluid flow through said valve occurs successively through said inlet, said first-mentioned passage means, said plurality of axial bores, said last-mentioned passage means and said orifice, and
orifice closure means located in said valve for reciprocal motion into and out of engagement with said orifice for opening and closing said valve,
said orifice closure means including pin means extending in sliding fit through said axial bore in said insert, through said passageway and into engagement with said pin located in said slot,
said orifice closure means normally being biased to close said valve by said biasing means through the biasing of said pin located in said slot.

4,073,470
PRESS DISC VALVE
Edward Harris, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.
Filed Jan. 4, 1977, Ser. No. 756,594
Int. Cl.[2] F16K *25/00*
U.S. Cl. 251—163 **9 Claims**

1. A pivotal disc shut-off valve comprising:
(a) a valve body;
(b) a valve seat integrally mounted within said valve body;
(c) a crank shaft positioned perpendicular to, but offset from, the central axis of said valve body;
(d) means for rotating said crank shaft about its axis;
(e) a crank lever fixed at one end to said crank shaft;
(f) a link member pivotally mounted on the other end of said crank lever;
(g) a valve disc pivotally disposed within said valve body and pivotally connected to the other end of each said link member, such that upon rotation of said crank shaft, said crank lever exerts linear force on said link member which, in turn, exerts linear force upon said disc;
(h) a plurality of pivotation extensions fixed to a common axis on said valve disc and extending beyond the periphery of said valve disc;
(i) a plurality of guide means positioned such that each of said pivotation extensions engages one or more of said guide means, said guide means being positioned so as to allow lateral travel of said pivotation extensions in a direction parallel to the central axis of said valve body;
(j) means for directing said pivotation extensions in said guide means, by lever action, initially in a linear direction parallel to the central axis of said valve body until a given position is reached, then redirecting the motion of said pivotation extensions into a rotation about the said common axis of said pivotation extensions such that said linear force exerted by said crank levers through said link members onto the said valve disc, by means of rotation of said crank shaft, causes said valve disc, with said pivotation

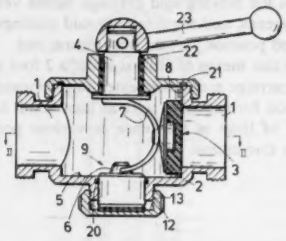


extensions fixed thereto, directed by said directing means, to move, firstly, in a lateral direction along the central axis of said valve body, secondly, to pivot about said common axis of said pivotation extensions, and, thirdly, to come to rest at a position at a right angle to the original position of said valve disc, and wherein said sequence of motion can be reversed by reversing the direction of rotation of said crank shaft.
(k) a hook member fixed at one to the center of, and positioned perpendicular to, said valve disc;
(l) a hook fixed to the free end of said hook member and positioned adjacent to said link member when said valve disc is in a plane parallel to said valve seat;
(m) a hook pin fixed to said link member and engaged with said hook when said valve disc is in the closed position against said valve seat, remaining engaged during said lateral motion of said valve disc, becoming disengaged as said valve disc pivots about said common axis of said pivotation extensions such that said linear force exerted onto said valve disc is transmitted to said valve disc through said hook pin, said hook and said hook member during said lateral motion of said valve disc.

4,073,471
SHUT OFF VALVE APPARATUS
Uuno Johannes Lehtinen, 33940 Pirkkala 4, Finland
Filed June 28, 1976, Ser. No. 700,148
Claims priority, application Finland, Aug. 14, 1975, 752302
Int. Cl.[2] F16K *25/00*
U.S. Cl. 251—176 **10 Claims**

1. Shut-off valve employing a valve body provided with at least two passage ports; a shut-off member cooperating with said passage ports; an operating shaft rotatably disposed in said valve body; said shut-off member being connected to an arcuate spring member braced against a staying member on the bottom of said valve body and connected to the operating shaft

at the top whereby said shut-off member being shiftable from one passage port to another by turning said operating shaft; said shut-off member being urged against said valve body inner surface in a radial direction by said arcuate member; said valve being further defined by an adjustable tensioning means con-



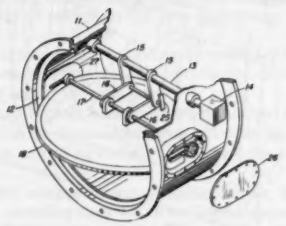
centric with said operating shaft, against which said arcuate member is braced, and by adjustment of which the pressure of said shut-off member against the inner surface of said valve body is adjustable with change of the curvature of said arcuate member.

4,073,472

ARTICULATED DISC VALVE

Henry G. Chasey, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jan. 4, 1977, Ser. No. 756,591
Int. Cl. F10k *31/54*
U.S. Cl. 251—229 **8 Claims**



1. A valve for use in a flow line, for controlling the flow of material, comprising:

a. a valve body;

b. a valve seat mounted to the internal periphery of said valve body;

c. a valve disc pivotally mounted within said valve body contiguous to said valve seat whereby said valve is closed;

d. a pivot shaft fixed to said valve disc perpendicular to the central axis of said valve body;

e. a crankshaft pivotally engaged with said valve body parallel to said pivot shaft;

f. a crank lever fixed to said crankshaft and perpendicular thereto;

g. a link member pivotally connected to the free end of said crank lever at one end, the second end being pivotally connected to said pivot shaft;

h. a plurality of slotted guide means, mounted on opposite walls of said valve body, said slots running parallel to the central axis of said valve body and positioned to engage the ends of said pivot shaft;

i. means of directing unilateral motion of said pivot shaft from the closed position of said valve to a point in said slots of said guide means at which said valve disc can be pivoted clear of said valve seat;

j. a plurality of gears fixed to said pivot shaft adjacent to said guide means; and

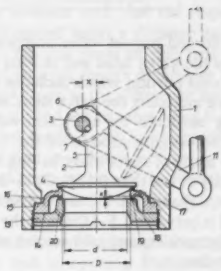
k. a plurality of racks aligned with said gears positioned so as to engage said gears at all points along said slots in said guide means wherein said valve disc can be pivoted clear of said valve seat.

4,073,473

ROTARY VALVE

Herbert Rihm, Hanau, and Walter Rogge, Erlensee, both of Germany, assignors to Honeywell G.m.b.H., Frankfurt am Main, Germany

Continuation of Ser. No. 522,888, Nov. 11, 1974, abandoned.
This application Dec. 20, 1976, Ser. No. 752,488
Int. Cl.[2] F16K *1/16*
U.S. Cl. 251—298 **5 Claims**



1. A rotary control valve comprising

a valve housing having a longitudinal axis, a fluid inlet, and a fluid outlet,

an axle in said housing having an axis which is at right angles to and is laterally displaced from said housing axis,

a plug mounted on said axle for rotation therewith within said housing, said plug having a spherical sealing surface which is rotated about said axis of said axle upon the rotation of said axle,

a flexible seat ring located in said housing between said inlet and said outlet, said seat ring having an annular outer portion having an axis coinciding with said housing axis and having an annular intermediate diaphragm portion of cup-shaped cross-section which extends from said outer portion substantially in the direction of the said axis of said outer portion and turns through substantially a right angle to terminate in two oppositely-directed annular lips which extend substantially at right angles to said diaphragm portion and parallel to said axis of said outer portion, and

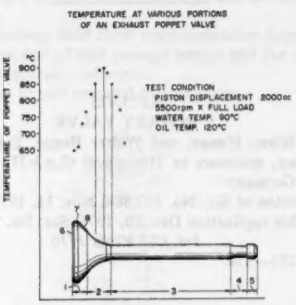
an annular retaining ring having an annular outer collar portion and having an annular inner collar portion constituting a hard seat portion, said outer collar portion being secured in said housing concentrically with said housing axis to secure therein said outer portion of said seat ring with one of said annular lips facing said axle, and with the other of said annular lips facing said hard seat portion,

whereby rotation of said plug which brings said spherical sealing surface into contact with said one of said annular lips establishes sealing engagement between the latter and said spherical sealing surface, and brings said other of said annular lips into sealing engagement with said hard seat portion, thereby to seal said inlet from said outlet.

4,073,474
POPPET VALVE

Kametaro Hashimoto; Kenji Ushitani; Yoichi Serino, all of Toyota, and Tadaoki Arakawa, Seto, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 30, 1975, Ser. No. 645,383
Claims priority, application Japan, Aug. 15, 1975, 50-99389
Int. Cl.[2] F16K *24/00*
U.S. Cl. 251—368 3 Claims

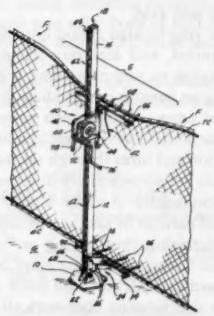


1. An upset-forged poppet valve comprising a first portion which includes the valve head and at least a part of the valve neck and a second portion which includes the remaining portion of the valve including the valve stem, said first and second portions being bordered by a friction-welded joint formed prior to an upset-forging process of the valve, wherein said first portion is made of super alloy having a composition consisting essentially of less than 0.15% C, 15–26% Cr, 1–10% Co, 5–18% Fe, more than 0.8% Ti, more than 0.8% Al, provided that Ti plus Al is between 1.6–5.0% and the substantial balance being Ni and impurities, and said second portion is made of a conventional valve steel.

4,073,475
CHAIN LINK FENCE STRAIGHTENER

Steven R. Gordon, Yakima, Wash., assignor to Fred C. Van Hoose, Yakima, Wash., a part interest

Filed June 10, 1976, Ser. No. 694,688
Int. Cl.[2] B66F *3/08;* B21F *33/00*
U.S. Cl. 254—66 15 Claims



1. A chain link fence straightener for straightening a bent segment of previously installed chain link fence without removal of the segment from the line of fence, said straightener comprising:

a. a ground engageable base member;

b. post means standing upwardly from said base member to a height at least about the normal height of the fence;

c. lower tine means of at least about a 2 foot span affixed to said post means and extending forwardly thereof slightly above said base member in a position for engaging with at least about four tines a plurality of links of the fence segment near the bottom thereof;

d. carriage means which enclose said post means while being carried thereby and relatively movable therealong;

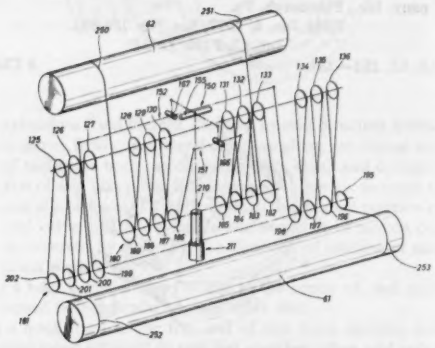
e. manually actuated drive means carried by said carriage means for moving said carriage means vertically on said post means, and for retaining said carriage means at any desired position on said post means; and

f. upper tine means of at least about a 2 foot span carried by said carriage means and extending forwardly thereof in a position for engaging with at least about four tines a plurality of links of the fence at various points above said lower tine means.

4,073,476
OVERHEAD CRANE WITH REDUNDANT SAFETY FEATURES

Louis N. Frank, Houston, Tex., assignor to Kranco, Inc., Houston, Tex.

Filed May 24, 1976, Ser. No. 689,041
Int. Cl.[2] B66D *1/26*
U.S. Cl. 254—184 23 Claims



11. In an overhead crane comprising a frame and a hook assembly, extendable and retractable through a plurality of sheave assemblies, the improvement which comprises:

a dual element hook adapted to support plural loads;

two indenpendently reeved hoisting systems, each system independently engaging the dual element hook and each system capable of supporting and lifting a first load on said hook;

the hoisting systems being adapted to operate in unison to provide redundant safety features when supporting and lifting said first load and when supporting and lifting a second load which is greater than said first load;

said two independently reeved hoisting systems including a lower load block assembly suspended from said frame, the lower load block assembly having an upper block sheave assembly associated with one of the independently reeved hoisting systems and a lower block sheave assembly associated with the other independently reeved hoisting system, said upper and lower block sheave assemblies being independently supported from each other, and in engagement with said hook; and

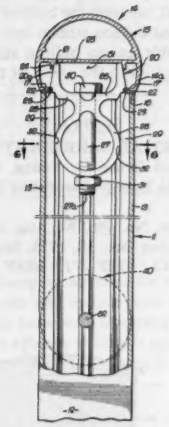
each independently reeved hoisting system includes an independent take-up means for extending and retracting said system.

4,073,477

RAILING WITH INTERFITTING RECTANGULAR AND CURVED CROSS SECTION MEMBERS

Donald H. Walters, 493 Stanford Drive, Arcadia, Calif. 91006

Filed Sept. 13, 1976, Ser. No. 722,739
Int. Cl.[2] B21F *27/00*
U.S. Cl. 256—22 12 Claims



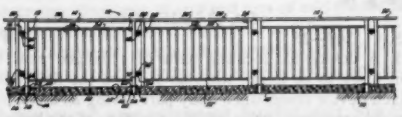
1. In a railing assembly, the combination comprising:
a. an upright post having generally rectangular cross section in horizontal planes,
b. an elongated upper rail including an upper section having an upwardly convex generally semicircular cross section in a plane normal to the direction of elongation, said upper section opening downwardly and extending directly over the open top of said post, the post supporting the upper section,
c. primary anchor means extending upwardly into the rail upper section and downwardly into the top of the post to anchor the rail to the post, and
d. an elongated bottom closure section attached to the rail upper section to close said downward opening, said closure section extending endwise proximate the side of the post,
e. said primary anchor means including a pair of upward projecting camming tines which are laterally spaced apart, each tine defining an upper terminal and a lower step shoulder, and said upper rail upper section defining laterally projecting ledges having detent locking engagement with said step shoulders, said primary anchor means including a downwardly projecting ring received into the post, there being a retainer extending vertically through the ring, the retainer being adjustable to clamp and expand the ring laterally for adjustable frictional retention to interior surfaces on the post, said tines and ring being integral.

4,073,478

FENCE STRUCTURE

Eduardo Bermudez, 610 Solano Prado, Coral Gables, Fla. 33156

Filed Feb. 28, 1977, Ser. No. 772,687
Int. Cl.[2] E04H *17/14*
U.S. Cl. 256—27 1 Claim



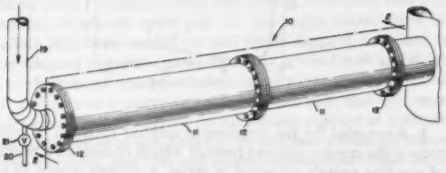
1. A fence comprising a pluality of fence sections of two types, a first type and a second type, each type fence section including a pair of spaced end posts, the end posts of said second type being of a second length and the end posts of said first type being of a first length, said first length being longer than that of said second length and defining downwardly extending end post portions, said portions being adapted to be inserted into recesses in a support surface; and fastener means to interconnect the end post of the first type and the second type, said fastener means comprising mating surfaces extending longitudinally from each of the end posts and including mating pin and slot means;
said fastener means including positioning means to guide the fence section in the fastening operation of adjacent fence sections; and
said positioning means comprising guide plates defining abutment surface on adjacent portions of the fastening means;
each of said fence sections includes an upper rail and a lower rail and said rails are spaced from one another defining a decorative panel and said fence including vertically extending, spaced slat members;
said fence being adapted to rest on a support surface having pairs of spaced recesses therealong defining a fence line and wherein the recesses of each pair are equispaced from one another a distance such that the respective vertical centerlines are spaced apart a distance equal to the distance between the end posts of said first type and said recesses are of an axial length depthwise in the support surface at least as long as the difference between said first and second length and the recesses being sized and configured and located on the fence line to receive an end post portion of said first type fence section;
means on said end post portions of the fence sections of said first type to limit penetration of said end post portions in said recesses;
said mating surfaces extending longitudinally from each of the end posts and comprising longitudinally extending surfaces arranged for sliding bypassing relation one over the other.

4,073,479

SULFIDIZATION REACTION

Martin C. Kuhn; John A. Stephens; Michael J. Noakes, all of Tucson, Ariz., and Allen D. Rovig, Butte, Mont., assignors to The Anaconda Company, Tucson, Ariz.

Division of Ser. No. 506,570, Sept. 16, 1974. This application Sept. 29, 1976, Ser. No. 727,648
Int. Cl.[2] F27B *7/14*
U.S. Cl. 266—173 5 Claims



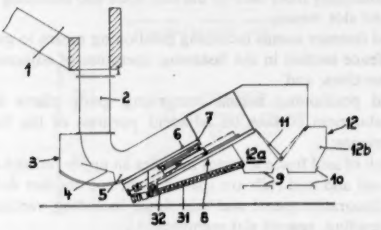
1. A reactor comprising elongated tubular means, shaft means mounted in said tubular means, and a plurality of paired blade members attached to said shaft and radially extending therefrom at spaced intervals therealong at approximately 30° pitch angles relative to the axial direction of the shaft, there being a reverse pitch direction of alternate pairs of said paired blade members extending in the same radial direction.

4,073,480

APPARATUS FOR THE PROCESSING OF SLAG

Johannes Josef Martin, and Erich Weber, both of Munich, Germany, assignors to Josef Martin Feuerungsbau GmbH, Munich, Germany

Filed May 13, 1977, Ser. No. 797,515
Claims priority, application Germany, May 21, 1976, 2622964
Int. Cl.[2] C21C 7/00
U.S. Cl. 266—201 23 Claims



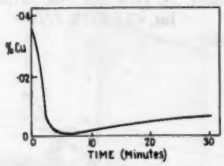
1. Apparatus for processing slag which issues from an industrial furnace or the like, comprising a liquid-containing quenching vessel for reception of slag; a duct having an inlet in communication with said vessel and a discharge end remote from said inlet; means for advancing quenched slag from said vessel into said duct so that the slag is caused to overflow said discharge end; and means for transporting the overflowing slag, including an elongated receptacle having a rear portion below said discharge end and a front portion at a level above said rear portion, a pusher reciprocable in said receptacle between a retracted position behind said discharge end and a forward position, and means for reciprocating said pusher between said positions so that the pusher advances overflowing slag in said receptacle toward said front portion during each movement from said retracted position.

4,073,481

CONTINUOUS SULPHUR DROSSING APPARATUS

Frank Lawson, Glen Waverley; Denby Harcourt Ward, and Robert George Kelly, both of Port Pirie, all of Australia, assignors to The Broken Hill Associated Smelters Proprietary Limited, Melbourne and Monash University, Clayton, both of, Australia

Filed July 14, 1976, Ser. No. 705,256
Claims priority, application Australia, Sept. 8, 1975, 3079/75
Int. Cl.[2] C22B 15/14
U.S. Cl. 266—215 12 Claims



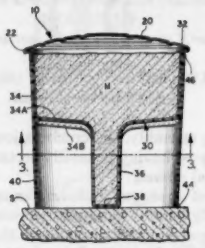
1. Apparatus for the continuous sulphur drossing of lead to reduce the copper content thereof which comprises a plurality of reaction vessels arranged in series, a stirring device in each reaction vessel for vigorously agitating the material therein, means for continuously feeding bullion to the first reaction vessel, means for continuously feeding sulphur to the first reaction vessel, a bullion feed rate controlling device for controlling the feed rate of the bullion, a sulphur feed rate controlling device for controlling the feed rate of the sulphur, means for heating the bullion in each reaction vessel, means for controlling the temperature of the bullion in each reaction vessel, means for continuously and concurrently flowing bullion, dross and any unreacted sulphur from each reaction vessel to the next in sequence, without back-mixing, an unagitated separation vessel, means for continuously and concurrently flowing decoppered bullion and dross from the final reaction vessel to the separation vessel, means for scraping the dross from the surface of the decoppered bullion in the separation vessel, and means for continuously withdrawing decoppered bullion from the separation vessel, wherein the bullion feed rate controlling device splits the feed bullion stream into a controlled bullion stream and a variable excess bullion stream, the controlled bullion stream being fed to the series of reaction vessels.

4,073,482

INERTIAL BARRIER SYSTEM

Wan Seegmiller, and Bruce O. Young, both of Sacramento, Calif., assignors to Energy Absorption Systems, West Sacramento, Calif.

Continuation of Ser. No. 496,784, Aug. 12, 1974, abandoned.
This application Dec. 18, 1975, Ser. No. 641,911
Int. Cl.[2] F16F 7/12; E01F 15/00
U.S. Cl. 267—139 8 Claims



1. An inertial barrier system for attenuating the energy of errant vehicles comprising:

module means defining a frangible container having a generally wine-glass type configuration with an open and enlarged upper portion and a closed and reduced lower stem portion for receiving a continuous mass of dispersible energy-attenuating material having a substantially uniform density throughout the material height so that the center of gravity of said mass is above said lower stem portion;

means to cover said open portion of said module means; and

means to stabilize said module means on a support surface in a manner which will transmit the vibrational energy of said surface to said continuous mass in said module means, said stabilizing means comprising an open-ended member engageable with said upper portion of said module means to stabilize said module means, with said stem portion operatively engaged with said support surface to support said module and said mass and transmit the vibrational energy of said surface to said mass.

4,073,483

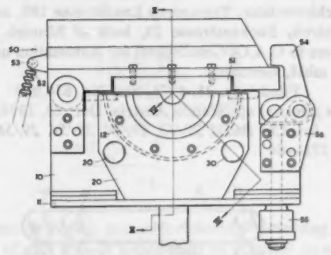
SUPPORTING DEVICE

Jack James Smith, Daventry, England, assignor to BOC Limited, London, England

Filed Jan. 19, 1977, Ser. No. 760,698
Claims priority, application United Kingdom, Jan. 21, 1976, 239876/76
Int. Cl.[2] B25B 1/04
U.S. Cl. 269—25 14 Claims

1. A device for locating parts of a flanged plain bearing which are to be joined together to form the finished article, which device comprises a body part having an arcuate seating surface extending across an upper surface of the body part, at least one substantially planar side surface area adjoining the

seating surface, means to clamp an arcuate bearing shell in the seating surface and means to clamp a separate bearing flange against the side surface area with the edges of the arcuate shell and the flange to be joined together, in abutment and exposed for welding by a laser beam, which latter means includes a



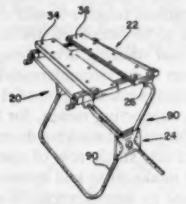
movably mounted clamping member for engaging the face of the flange remote from said surface area, and means to move the clamping member between a clamping position in which it exerts a force against a flange to hold it against the side surface and a free position in which such force is released.

4,073,484

PORTABLE WORKBENCH ASSEMBLY

Gerald Beekenkamp, Etobicoke, Canada, assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed Oct. 4, 1976, Ser. No. 728,940
Int. Cl.² B25B *1/22*; A47B *3/02*
U.S. Cl. 269—321 CF **3 Claims**



1. A portable workbench comprising:

a foldable support stand;

a workpiece supporting and clamping assembly supported thereon, the workpiece supporting and clamping assembly including a base frame; a pair of elongated top members located on the base frame and defining upper work supporting surfaces lying generally in a common plane and having opposed side portions defining clamping surfaces; and, clamping means operatively connected between said base frame and one of the top members for moving the latter toward and away from the other top member to provide for the clamping of workpieces between the top members;

said support stand including: a pair of generally rigid frames, each frame including a spaced apart pair of end legs and an upper longitudinally extending generally horizontal member, interconnecting said end legs;

pivot means for pivotally connecting said frames together at corresponding ones of said end legs of said frames below said horizontal members to permit said frames to be pivoted relative to one another between an open support position where the frames are angularly arranged relative to one another with their horizontally extending members being spaced a predetermined distance apart, to a folded position wherein the frames are in juxtaposition to one another, said pivot means including stop means for defining said open position and preventing collapse of said support stand in said open position;

resilient clip means for releasably engaging said upper horizontal members when the support stand is in the open support position to secure said workpiece supporting and clamping assembly to the support stand when in use and to permit the workpiece supporting and clamping assembly to be removed therefrom to facilitate handling and storage of the portable workbench; and,

slot means formed in said base frame so as to extend transversely to said horizontal members;

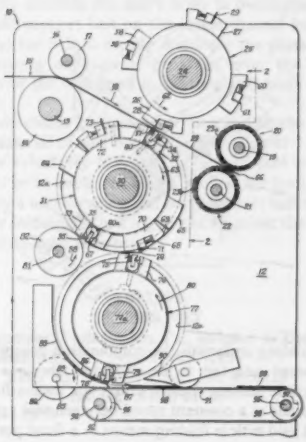
said resilient clip means having engaging means slideably engaging said slot means to permit said horizontal members to move relative to said base frame to change said predetermined distance in response to deflections of said frames about said pivot means produced by forces applied by an operator to said assembly, said forces being transmitted from said assembly to said frames through said resilient clip means.

4,073,485

APPARATUS FOR MAKING MULTIPLE PAGE PRINTED BOOKLETS

Clyde G. Gregoire, Bensenville; James A. Hartman, Brookfield, and Milton J. Gregoire, Lombard, all of Ill., assignors to Gregg Engineering Corporation, Lyons, Ill.

Filed Jan. 10, 1977, Ser. No. 758,079
Int. Cl.² B41F *13/56*
U.S. Cl. 270—21 **6 Claims**



1. An apparatus for making multiple page booklets from a continuously printed web comprising a frame support, a pair of cooperative rotatably driven feed rollers carried on said frame support, a spaced apart pair of yieldingly cooperative web pulling members carried on said frame support, said feed rollers adapted to receive a continuously printed web and deliver it to the spaced apart pair of yieldingly cooperative members for pulling and supporting an end of said web, first and second operational rollers carried on said frame support at a location generally between said feed rollers and said yieldingly cooperative members, said first and second operational rollers having tangentially joining surfaces coincident with the path of the printed web disposed between the feed rollers and the pair of yieldingly cooperative web pulling members, a plurality of similarly sized and shaped working boxes, means for adjustably positioning said working boxes about said operational rollers, the first of said operational rollers having one such box equipped with a web tucking member and having another such box equipped with a knife member, and the second said operational roller having one such box equipped with a web grip-

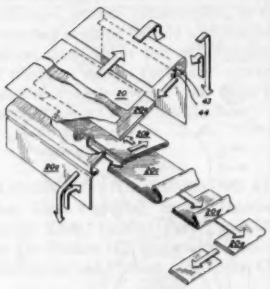
ping means for cooperation with the web tucking member of the one such box of the first of said operational rollers, and the second of said operational rollers having another such box equipped with an anvil for cooperation with the knife member of the another such box of the first of said operational rollers, and a third operational roller carried on said frame support having a tangential joining surface with the second of said operational rollers, said third operational roller having one such box equipped with a web gripping means, and said second operational roller having still another such box equipped with a tucker member arranged for cooperation with the one such box equipped with the gripping means on the third operational roller, and cam means associated with said frame support and said boxes equipped with said gripping means to effect an intermittent opening of said gripping means to receive a bight of the printed web by said tucker members, and means closing said gripping means on said web bight, whereby the continuously printed web is cut and folded into a multiple page booklet at printing press speeds as it is moved in a path around the operational rollers having the working boxes thereon.

4,073,486

FOLDER CONSTRUCTION

Kasimir Kober, Chicago, Ill., assignor to Chicago Dryer Company, Chicago, Ill.

Continuation-in-part of Ser. No. 570,058, April 21, 1975, abandoned. This application Sept. 30, 1976, Ser. No. 728,079
Int. Cl.[2] B65H *45/00*
U.S. Cl. 270—69 **3 Claims**



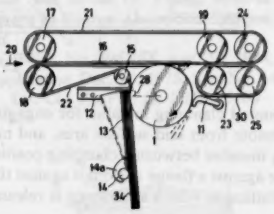
1. In a folding apparatus the combination comprising article folding means adapted to be mounted above a supporting surface; article sensing means; conveyor means for moving a foldable article at a constant speed between said article sensing means and said article folding means in a fixed period of time; said article sensing means being disposed adjacent the conveyor path and being sensitive to passage thereby of the article leading and trailing edges; control means adapted to be activated following receipt of a signal from said article sensing means while sensing a foldable article; said control means comprising a time/count control adapted to count out time at a normal rate and at a less than its normal rate; said control having a count entered therein corresponding to said fixed period of time; said time/count control emitting a signal for activating said folding means after said time/count control has counted out said count entered therein; the entered count being counted out at said rate less than its normal rate while activated by said article sensing means and said entered count being counted out at said normal rate following passage of the foldable item from engagement with said sheet sensing means; an AC time signal having positive and negative half wave pulses operating at a frequency of 60 cycles per second driving said time count control; said time/count control counting the positive half wave pulse only of said time signal during the interval the article sensing means senses the foldable article and thereafter counting both the positive and negative half wave pulses of said time signal until said time/count control has counted out the count entered therein.

4,073,487

DISCHARGING AND STACKING DEVICE FOR FLAT ARTICLES

Harry Schirrmeister, Tegernseen Landstrasse 185, and Markus Haberstroh, Euckenstrasse 21, both of Munich, Germany, assignors to G.A.O. Gesellschaft fur Automation und Organisation mbH, Germany

Filed Nov. 21, 1975, Ser. No. 634,029
Claims priority, application Austria, Dec. 23, 1974, 10263/74
Int. Cl.[2] B65H *29/12, 29/24, 29/54, 29/58*
U.S. Cl. 271—64 **8 Claims**



1. In a discharging and stacking device for flat articles to be conveyed, such as sheets of paper and documents, of the type including a stacking drum having openings in its periphery by means of which the articles to be conveyed can be held by suction against the drum and accumulated in an orderly stack, with the suction being effective within only a predetermined angular range of rotation of the stacking drum, the improvement comprising, in combination, a conveying system operable to feed flat articles to said stacking drum; means mounting said stacking drum at a position, relative to said conveying system, such that the articles to be conveyed are fed tangentially to said stacking drum; said stacking drum being formed with a single row of openings in its circumferential periphery, with said single row of openings extending parallel to the axis of said stacking drum; stack supporting means, for the articles to be stacked, mounted adjacent said stacking drum; means operable selectively to connect said single row of openings to a source of vacuum, to supply intake air to said openings, or to a source of air under pressure, to supply pressure air for discharge through said openings; whereby, with suction being effective at said openings, the delivered articles to be conveyed are held, by their leading edges, against said stacking drum, discharged around said stacking drum and fed to said stack supporting means while, with air under pressure discharged through said openings, the articles to be conveyed are caused to pass by said stacking drum; and a following conveying system operable to receive articles passing by said stacking drum.

4,073,488

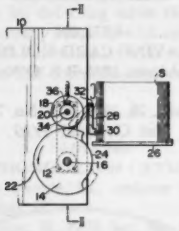
DEVICE FOR DETECTING THE THICKNESS OF SHEETS

Isamu Uchida, Chigasaki, Japan, assignor to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Nov. 26, 1975, Ser. No. 635,764
Claims priority, application Japan, Nov. 29, 1974, 49-138073
Int. Cl.[2] B65H *7/12*
U.S. Cl. 271—263 **3 Claims**

1. A device for detecting the thickness of bank notes or other sheets comprising a seizing roller, a first shaft mounted for counterclockwise rotation and supporting said seizing roller, a feed roller, a second shaft mounted for clockwise rotation and supporting said feed roller, said seizing roller including a peripheral length slightly longer than each of the bank notes to be transferred and a recess for receiving the forward end of each bank note until it has been engaged between the peripheral portion of the seizing roller and the feed roller to pass the bank note between said rollers, said second shaft supporting the feed

roller having a diameter smaller than that of said first shaft to permit upward displacement thereof relative to the first shaft in the event of the passage of at least one bank note and a



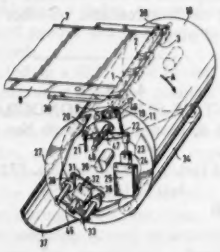
displacement detecting means for directly detecting the displacement of said second roller shaft to produce an electrical signal in accordance with the thickness of said at least one bank note.

4,073,489

DOCUMENT TRANSPORT DEVICE

Hermann Idstein, Oestrich-Winkel, and Peter Loew, Wallau, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 24, 1977, Ser. No. 771,779
Claims priority, application Germany, Feb. 26, 1976, 2607774
Int. Cl.[2] B65H *29/06*
U.S. Cl. 271—277 **21 Claims**



1. A device for transporting an original to be copied while resting on a supporting surface in a reproduction apparatus, comprising:

a shaft extending across the width of the supporting surface and being arranged in spaced relationship substantially parallel therewith;

a plurality of means in spaced attachment along said shaft and responsive to rotation of the shaft for clamping the leading edge of the original;

a flexible strip member commonly covering said clamping means and being adapted to protect the leading edge of the original in the clamped position;

means engaging one end of said shaft in an original-receiving position for opening and closing said clamping means by rotating said shaft; and

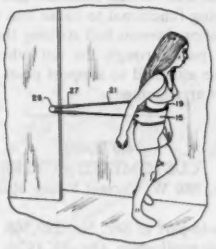
means engaging one end of said shaft in an original-releasing position for opening said clamping means by rotating said shaft.

4,073,490

BODY ATTACHED RESTRAINING TYPE EXERCISING DEVICE

Jack Vincent Feather, P.O. Box 737, Pebble Beach, Calif. 93953

Filed June 4, 1976, Ser. No. 692,900
Int. Cl.[2] A63B *21/04*
U.S. Cl. 272—136 **5 Claims**



1. An improved exercising device comprising

a relatively wide elastic body engaging band,

a substantially inelastic reinforcement material secured to one side of said body engaging band forming a body support belt,

a relatively wide elastic wrap band means secured to and extending substantially beyond one end of the body support belt whereby said wrap band means may be stretched to tightly encircle the user's body in overlapped relation with said support belt on the inside thereof between the user and the belt to evenly distribute the pressure developed during an exercise program, over the contacted portion of the body and to insulate said body contacted portion,

at least one elastic cord member attached to the reinforcement material of said body support belt, and

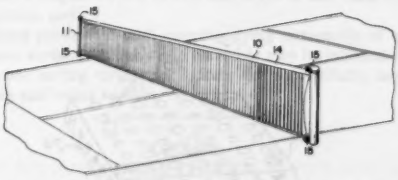
means for releasably hooking the end of said elastic cord member to an anchored object such as the knob of a door whereby a user wearing said body support belt around the waist or midsection can jog in place against the tension of said elastic cord member.

4,073,491

TENNIS NET

Walter J. Sepaniac, Philadelphia, Pa., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Apr. 12, 1976, Ser. No. 675,728
Int. Cl.[2] A63B *61/00*
U.S. Cl. 273—29 B **2 Claims**



1. A tennis net for use on a conventional lawn tennis court comprising

a pair of horizontally extending, vertically spaced, upper and lower suspension members, and a plurality of horizontally spaced, vertically extending, elastic members, each said vertical member being a section of a continuous elastic cord;

each suspension member being formed of a flexible cable enclosed by a fabric sleeve of U-shaped configuration, the legs of said U-shaped sleeve of said upper suspension member being turned downwards while the legs of said

U-shaped sleeve of said lower suspension member are turned upwards;

means connecting the legs of each U-shaped sleeve in substantially equally spaced locations along the length of said suspension members, said continuous elastic cord being attached between means of said upper and lower U-shaped sleeves to form said plurality of horizontally spaced, vertically extending, elastic members;

the elasticity of said vertical members and the spacing therebetween being functional to cause loss of Kinetic Energy of a conventional tennis ball striking the net but allowing the ball to pass through the net when said suspension members are attached to support posts of a conventional tennis court arrangement.

4,073,492

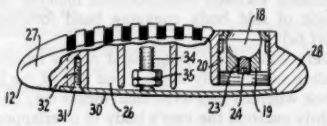
CUSTOMIZED PUTTER

David L. Taylor, 380 W. Carmel Valley Road, Carmel Valley, Calif. 93924

Continuation-in-part of Ser. No. 597,548, July 21, 1975, abandoned. This application Apr. 29, 1976, Ser. No. 681,542

Int. Cl.[2] A63B *53/02*

U.S. Cl. 273—80.2 **6 Claims**



4. The method of adjusting a club head and shaft of a golf club for approved competitive use comprising the following steps, providing the head of said club with movable means for mounting a shaft, said means having a projection positioned to extend above the upper surface of said head and adapted to receive the end of shaft, permanently securing said shaft to said projection on said movable mounting means, moving the shaft and movable mounting means as a unit to an adjusted angular position of said shaft with respect to said head to meet the attitude needs and requirements of the user, and irreversibly securing the movable joint of the club head in the adjusted position.

4,073,493

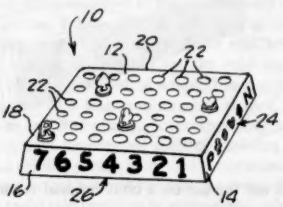
BRIDGE BID RECORDING DEVICE

Stephen T. Moreland, 789 Anita Ave., Grosse Pointe Woods, Mich. 48236

Filed July 30, 1976, Ser. No. 710,234

Int. Cl.[2] A63F *1/18*

U.S. Cl. 273—148 R **11 Claims**



8. A device for recording and retaining the bids of a single player in a game of bridge comprising means providing a plurality of holes formed in a rectangular array of seven rows and six columns; first means identifying each said column with one of the bid types: pass, clubs, diamonds, hearts, spades, and no-trump; second means identifying each said row with the one of the bid levels: one through seven; and a plurality of tokens selectively insertable into each said hole for indicating the type and level of a player's bid during each round of bidding, said tokens including means associating respective ones of said tokens with the bid types: pass, clubs, diamonds, hearts, spades, no-trump, double and redouble.

4,073,494

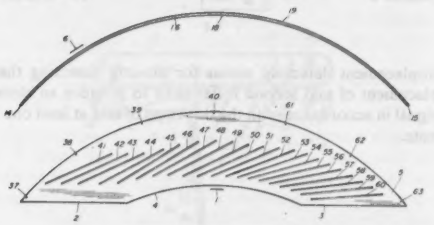
PLAYING CARD HOLDER

Patricia Louise McAdams, 1865-B S. O'Neal Ave., Charleston, S.C. 29404

Filed Aug. 20, 1976, Ser. No. 716,191

Int. Cl.[2] A63F *1/10*

U.S. Cl. 273—150 **17 Claims**



1. A device for holding playing cards for a card player comprising:

(a) a structure operative to rest on a surface;

(b) a plurality of non-parallel slots in the top of said structure operative to hold said playing cards vertically with respect to said surface and said nonparallel slots being angled sufficiently and so disposed relative to each other that an upper corner of said playing cards indicating the identity of said playing cards is visible and readable only to said card player facing said structure, each of said non-parallel slots completely surrounding the lower portion of each of said playing cards when each of said playing cards is inserted in each of said non-parallel slots; and

(c) a shield connected to said structure operative to make said playing cards unreadable to other persons playing with said card player.

4,073,495

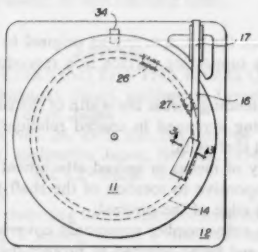
ADVANCEMENT OF STUCK PHONOGRAPH NEEDLES

Peter Royce, 205 S. Linden Ave., South San Francisco, Calif. 94080

Filed Oct. 13, 1976, Ser. No. 732,039

Int. Cl.[2] G11B *3/00*

U.S. Cl. 274—1 R **14 Claims**



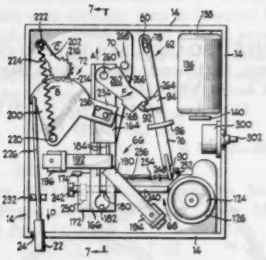
1. A device for advancing a "stuck" stylus having a current output for use in a record player having a turntable on which a record having multiple grooves is rotated and a tone arm having a stylus to engage said record, comprising impact means mounted on or in said tone arm of a phonograph operable to deliver an impact to said tone arm to drive said stylus

upwardly and inwardly relative to said record to advance said stylus at least one record groove and actuating means for actuating said impact means, said actuating means comprising recording means for temporarily making a temporary record of the output of said stylus for one rotation of said turntable, comparison means for detecting when the current output of said stylus is substantially identical with said temporary record and thereby to detect when said stylus is stuck in a groove, and means responsive to said comparison means for activating said impact means.

4,073,496
PHONOGRAPH DEVICE

Gordon A. Barlow, Skokie, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Mar. 31, 1976, Ser. No. 672,319
Int. Cl.² G11B *25/04*
U.S. Cl. 274—9 B **10 Claims**

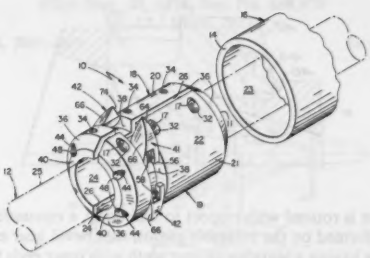


1. A toy phonograph comprising, in combination:
a housing including a record-receiving slot;
a turntable rotatably mounted on the housing;
a spindle mounted on the housing to move toward and away from the turntable;
drive means for rotating the turntable;
a tone arm including a stylus, mounted on the housing to track a record groove and to move the stylus off of and onto the record;
cam means including a slider plate having an extended portion for engagement with the periphery of a record to move therewith from a normal eject position to a play position when a record is inserted through the record-receiving slot, and a cam surface engageable with the movable spindle to cause the spindle to move into engagement with the record as the slider plate is moved to the play position during record insertion;
a speaker cone assembly having an armature biased against the tone arm for amplifying vibrations transmitted through the tone arm by the record groove; and
a record comprising a plurality of concentric selections of predetermined size, each selection comprising a spiral groove having an ending circular groove and a blank land area between each of said concentric selections whereby the pickup stylus must be lifted from the record and moved over the land area to the beginning convolution of the next spiral record groove;
tone arm control means for moving the stylus into and out of engagement with the record groove and for moving the tone arm in a plane parallel to the recorded surface, said control means including a pivotally mounted lever means engageable with the slider plate for lifting the tone arm when the slider plate means to the eject position, and said lever means including detent means for moving the tone arm in plane to cause the stylus to skip over the intermediate land area of the record to thereby play the next smaller concentric selection when a record is inserted through the slot.

4,073,497
CARE CHUCK STOP ASSEMBLY

Richard Edward Flagg, East Bridgewater, and Blaine Potter, Sharon, both of Mass., assignors to Double E Company, Inc., Brockton, Mass.

Filed Aug. 2, 1976, Ser. No. 710,904
Int. Cl.² B23B *31/40;* B65H *17/02*
U.S. Cl. 279—2 R **14 Claims**



4. A stop assembly comprising:
a body having an outer surface adapted for engaging the interior surface of a hollow core and arranged for mounting securely on a shaft;
a plurality of fingers secured to said body for pivotal movement relative thereto about respective axes generally parallel to the axis of said outer surface between respective first positions in which said fingers lie within said outer surface and respective second positions in which said fingers project beyond said outer surface; and,
means for biasing said fingers towards said second positions,
said body including a plurality of substantially identical body portions each subtending an arc of less than 180°, defining a portion of said outer surface, including an annular groove in the outer surface thereof and having circumferentially spaced side edges extending generally parallel to the axis of said outer surface,
adjacent side edges of said body portion being spaced from each other when said assembly is mounted on said shaft,
each of said fingers defining a core engagement surface lying in a plane generally perpendicular to the axis of said outer surface and defining a camming surface facing generally away from and inclined relative to said core engagement surface thereof,
said core engagement surfaces of all of said fingers being substantially coplanar and facing in the same direction,
a pair of said fingers being mounted in each said groove with the free end of each of said pair being adjacent and the axis of pivotal movement of each of said pair being spaced from a respective one of said side edges of said each body portion, and
no fixed portion of said assembly lying outwardly of said outer surface whereby said assembly may be inserted into a core having an interior surface not substantially larger than said outer surface.

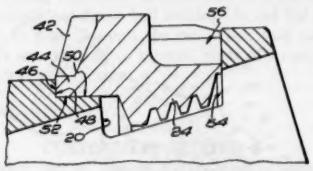
4,073,498
DRILL CHUCKS

George Cecil Derbyshire, Sheffield, England, assignor to The Jacobs Manufacturing Company, Limited, Sheffield, England

Filed Mar. 8, 1976, Ser. No. 664,489
Claims priority, application United Kingdom, Apr. 1, 1975, 13271/75
Int. Cl.² B23B *31/04*
U.S. Cl. 279—62 **3 Claims**

1. A drill chuck comprising a body part formed to provide spaced converging bores for the reception of jaws which are movable relative to an axially extending bore formed in the body part, and being further formed to provide a circumferential groove extending about the periphery of the body part and

intersecting the spaced bores, a jaw located in each said bore, each said jaw having a gripping portion and a threaded portion on part of its surface, a ring shaped rotatable means defining an integral bevel gear portion located at an end of said ring and a threaded nut portion located on the internal wall of said ring, said ring being positioned in the circumferential groove with the nut member portion being threadably engaged with said jaws to provide movement of said jaws when the bevel gear



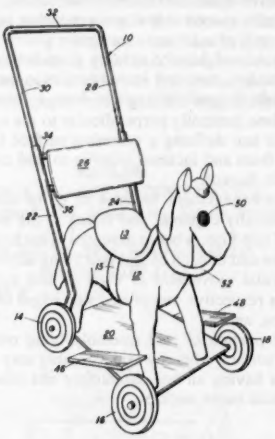
element is rotated with respect to said body, a circumferential collar formed on the rotatable means, said bevel gear element portion having a plurality of gear teeth with inner ends formed integrally with and being bounded by the circumferential collar, an end surface of said collar being in abutment with a radial surface of the circumferential groove, and a cylindrical sleeve at one end of which engages a portion of the rotatable means, the other end of which engages the body part.

4,073,499

STROLLER FOR A CHILD

Frank Damone, 166 Porter St., Stratford, Conn. 06947, assignor to Frank Damone, Stratford, Conn.

Filed June 18, 1976, Ser. No. 697,392
Int. Cl.² B62B *7/00*
U.S. Cl. 280—1.1 R **2 Claims**



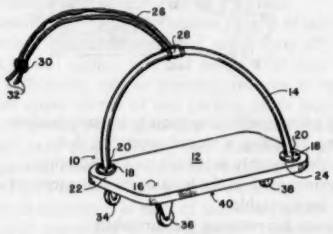
1. A stroller for a child comprising an animal figurine mounted on wheel means for rolling said animal figurine over a surface, a saddle shaped seat positioned on the back of said animal figurine for supporting a child thereon in a seated position astride the back of said animal figurine, back support means comprising parallel rails and a back rest positioned upwardly from said animal figurine for providing back support for a child sitting on said saddle shaped seat, handle means extending upwardly from said back support means for grasping by a person walking behind said stroller and for pushing said stroller; said handle means comprising an adjustable handle retractably extendible from and towards said parallel rails; said parallel rails comprising a first pair of parallel tube members having catch means thereon for releasably securing said handle means in any of a plurality of extended positions, said handle means comprising a second pair of parallel tubes telescopically engaging said first pair of parallel tubes, and releasably securable thereto by said catch means, transverse bar means spanning said second pair of parallel tubes at the uppermost extremity thereof for rigidly separating said second pair of parallel tubes and for grasping by a person walking behind said stroller and for pushing said stroller, said catch means comprises a tube transversely positioned between said first pair of parallel tubes in openings in said first pair of parallel tubes, transversely displacable shaft means in said tube, for operatively engaging said second pair of parallel tubes through said openings in said first pair of parallel tubes, resilient means in said tube for operatively engaging and resiliently biasing said shaft means through at least one of said openings in said first pair of parallel tubes, spaced shaft receiving openings in said second pair of parallel tubes for receiving said shaft means, second handle means extending from said shaft for manually moving said shaft out of said openings in said second pair of parallel tubes.

4,073,500

WHEEL BOARD UNDULATING COASTER

Leo Campeau, 6621 Arcola Street, South Burnaby, British Columbia, Canada (V5E 1H2)

Filed Aug. 24, 1976, Ser. No. 717,041
Int. Cl.² B60D *3/00*
U.S. Cl. 280—87.04 R **3 Claims**



1. A wheel board undulating coaster comprising a generally planar platform, three ground contacting wheels mounted for rotation on the underside of the platform and positioned in a triangular arrangement, means for mounting one of the three wheels for swiveling movement about a vertical axis normal to the axis of rotation thereof, and all three wheels having peripheral surfaces eccentric to the axes of rotation thereof, a generally U-shaped support member, said support member affixed on the uppermost side of the platform, the free ends of the U-shaped member being disposed fixedly secured to said uppermost side of said platform, said platform having a generally rectangular shape, said free ends being disposed adjacent diametrically opposed corners of said platform.

4,073,501

VEHICLE ENTRY WAY ELEVATOR STEP

Donald G. Grow, R.R. 1, Perry, Iowa 50220

Filed May 28, 1976, Ser. No. 690,980
Int. Cl.² B60R *3/02*
U.S. Cl. 280—164 R **11 Claims**

1. In combination a vehicle, having an access entry way and an elevator step comprising,

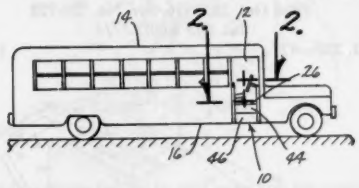
a floor in said vehicle above the outside ground level,

said entryway being defined by a pair of opposite sidewalls, a back wall and a door opposite said back wall,

said elevator step being positioned in said entryway and being movable between a raised position in the plane of said floor and a lowered position adjacent the ground to a position between said floor and the ground substantially in the plane of the bottom of the vehicle,

power means connected to said elevator step for raising and lowering said elevator step, and

a closure plate being positioned below and in operative engagement with said elevator step and being yieldably held in a raised position in the plane of the bottom of the vehicle for closing the bottom end of said access entry-



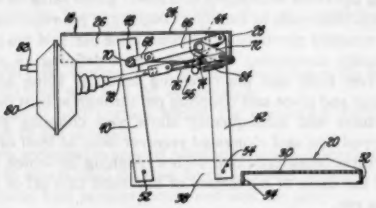
way, and said closure plate being larger in area than said elevator step and said bottom end of said access entryway whereby when said elevator step is lowered below the bottom of said vehicle said closure plate is moved downwardly by said step and when said step is raised above the bottom of said vehicle, said closure plate engages and is retained by the bottom of said vehicle.

4,073,502

RETRACTABLE STEP

Raymond C. Frank, 4083 Second St., Brown City, Mich. 48416, and Ronald R. Frank, 2051 Forest Drive, Lapeer, Mich. 48446

Filed June 21, 1976, Ser. No. 697,959
Int. Cl.² B60R *3/02*
U.S. Cl. 280—166 **3 Claims**



1. A retractable step, comprising;

a step supporting member,

a step member,

pivotal linkage connecting said step member to said supporting member for movement between a first position raised and retracted up under said supporting member and a second position lowered and extended in front of said supporting member,

operative means provided on said supporting member and connected to said pivotal linkage for raising and retracting said step member into said first position,

biasing means connected to said operative means and acting to dispose and hold said step member in said second position,

said operative means including an overcenter linkage set by said biasing means for locking said step member in said second position for safe use,

power operated means connected to said operative means and having overriding opposition to said biasing means for unlocking said step member and allowing the raising and retraction thereof,

said power operating means including a diaphragm operated mechanism having one side thereof connected to a vacuum pressure source and the other side to said operative means,

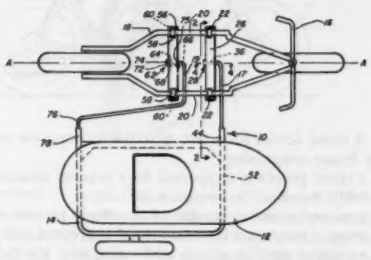
and including door operated switch means interposed between said vacuum pressure source and said operative means for venting the system and inactivating said power operated means.

4,073,503

MOTORCYCLE SIDECAR MOUNTING BRACKET

David H. Hokans, Rte. 3, Box 228A, Plant City, Fla. 33566

Filed Mar. 24, 1976, Ser. No. 669,978
Int. Cl.² B62K *27/12*
U.S. Cl. 280—203 **14 Claims**



1. A bracket for mounting the frame of a motorcycle sidecar onto the frame of a motorcycle comprising;

crossbar means adapted to be rigidly mounted on the motorcycle frame, said crossbar means being mounted transversely to the central longitudinal axis of the motorcycle,

bracket member means adapted to extend between the crossbar means and the sidecar frame, said bracket member means having means adapted to connect the bracket member means with the sidecar frame,

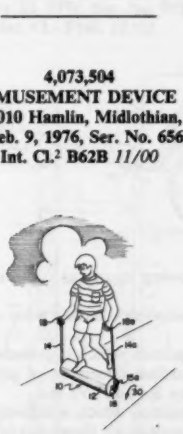
a pivotal connection adapted to join said bracket member means and said crossbar means, and adapted to permit pivotal movement therebetween, thereby also permitting pivotal movement of said bracket member means with respect to said motorcycle.

4,073,504

AMUSEMENT DEVICE

Catherine Knapp, 15010 Hamlin, Midlothian, Ill. 60445

Filed Feb. 9, 1976, Ser. No. 656,356
Int. Cl.² B62B *11/00*
U.S. Cl. 280—220 **8 Claims**



1. An amusement device for treading thereon, comprising:

a. a cylindrical member comprising a hollow cylinder with a pair of end caps each supporting a bearing,

b. an axle that journals within said cylindrical member and

c. a pair of flexible stabilization straps attached at opposite ends of said axle.

4,073,505

STAND DEVICE FOR A TWO-WHEELED MOTORCYCLE

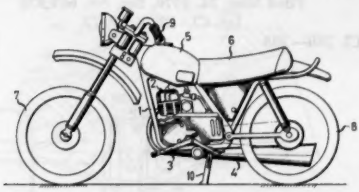
Yorio Yamazaki, Kakogawa, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Filed July 14, 1976, Ser. No. 705,253

Claims priority, application Japan, July 30, 1975, 50-106079[U]

Int. Cl.[2] B62H *1/06*

U.S. Cl. 280—301 5 Claims



1. A stand device for a two-wheeled motorcycle including a body frame comprising:

a. a stand pivotally supported by a bracket attached to said body frame of the motorcycle;

b. a pivotal member capable of moving in pivotal movement about a point at which said stand is pivoted and including an upper portion above said point, said pivotal member moving in pivotal movement independently of said stand and having a portion which moves said stand from its operative position to its neutral position;

c. a main spring mounted between the upper portion of said pivotal member and said stand; and

d. an auxiliary spring mounted between the upper portion of said pivotal member and the bracket and adapted to urge by its biasing force the pivotal member to act in such a manner that the stand is restored from its operative position to its neutral position.

4,073,506

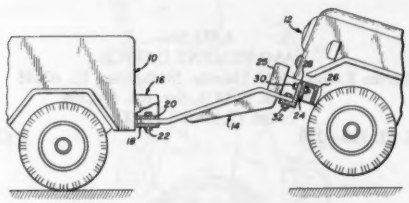
VEHICLE TOWING APPARATUS

Paul E. Pressley, 312 Whitecliff Drive, Vallejo, Calif. 94590

Filed Mar. 26, 1976, Ser. No. 671,002

Int. Cl.[2] B60D *1/14*

U.S. Cl. 280—402 9 Claims



1. A vehicle towing apparatus comprising a rigid plate including;

an elongated midportion having a top surface and a bottom surface;

a leading end portion which is deflected upwardly relative to the longitudinal dimension of said midpoint at a first angle between 20° and 25°; and

a trailing end portion which is deflected downwardly relative to the longitudinal dimension of said midportion at a second angle between 30° and 35°;

stiffening web means connected to and extending longitudinally along a majority of the length of said midportion and connected to said trailing end portion; and

means associated with said leading end portion for coupling the apparatus to a towing vehicle and means associated with said training end portion for coupling the apparatus to a towed vehicle whereby the coupled end of said towed vehicle is carried in an elevated position above its normal resting position and is supported in such elevated position by the towing vehicle.

4,073,507

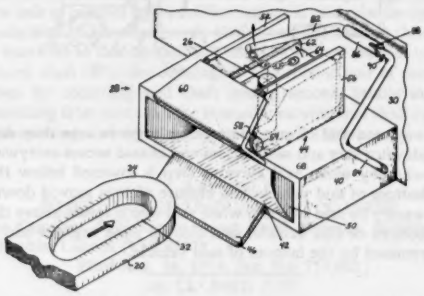
CAR COUPLING

Billy Dingess, Ferrellsburg, W. Va., assignor to Lester Construction Co., Hurricane, W. Va.

Filed Oct. 28, 1976, Ser. No. 736,772

Int. Cl.[2] B60D *1/14*

U.S. Cl. 280—477 11 Claims



1. A mine car coupling apparatus comprising a coupling pin support housing mounted to a first mine car, said coupling pin housing defining two aligned apertures, a coupling pin assembly pivotally mounted on said coupling pin housing with a coupling pin extending through both of said coupling pin support housing apertures, said coupling pin support housing being provided with upper and lower guide surfaces and inner curved side walls to facilitate coupling, a pin receiving assembly mounted pivotally to a second mine car, said pin receiving assembly comprising a torque means defining an elongated receiver hole, said pin receiving assembly being adapted to engage and pivot said coupling pin through at least one of said apertures and subsequently allow said coupling pin to be dropped into said elongated receiver hole, at least one of said apertures being provided with a retaining lip which serves to take the stress of movement of said mine cars off of said coupling pin.

4,073,508

ADJUSTABLE TRAILER HITCH

Jimmie George, P.O. Box 212, and Charles P. Tyson, P.O. Box 191, both of, Mer Rouge, La. 71261

Continuation-in-part of Ser. No. 563,216, March 28, 1975, Pat. No. 3,979,138. This application July 19, 1976, Ser. No. 706,394

The portion of the term of this patent subsequent to Sept. 7, 1993, has been disclaimed.

Int. Cl.[2] B60D *1/06*

U.S. Cl. 280—478 R 24 Claims

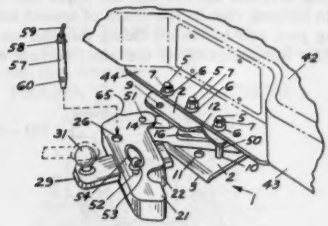
1. An adjustable trailer hitch comprising:

(a) a housing;

(b) an inner arm pivotally attached to said housing at one end of said inner arm;

(c) an outer arm pivotally attached to the free end of said inner arm to form an elbow hinge, said inner arm and said outer arm being relatively movable about said housing and said elbow hinge, and further including stop portions in said elbow hinge to permit extension of said outer arm at no greater than an acute angle with respect to said inner arm, said outer arm and said inner arm being foldable about said elbow hinge into abutting relation with respect to each other and with respect to said housing when said inner arm and said outer arm are pivoted on said housing in retracted configuration;

(d) lock means in cooperation with said outer arm and said housing to secure said inner arm and said outer arm in said retracted configuration; and



(e) coupling means carried by said outer arm for coupling to a trailer to facilitate towing.

4,073,509

SAFETY SKI BINDING

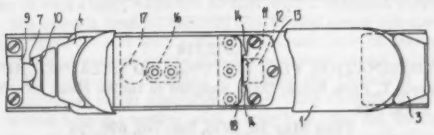
Ulrich Gertsch, Matten, Switzerland, assignor to E. + U. Gerstch AG, Ski-Produkte, Interlaken, Switzerland

Filed Feb. 2, 1976, Ser. No. 654,650

Claims priority, application Switzerland, Feb. 14, 1975, 1868/75

Int. Cl.² A63C *9/081*

U.S. Cl. 280—618 **13 Claims**



1. A safety ski binding for releasably securing a ski boot having a ski boot sole to a ski, comprising;

an automatic heel portion means for permitting forward release of the ski boot;

a toe jaw arranged in spaced relation to said automatic heel portion means, said ski boot being received between said automatic heel portion means and said toe jaw;

a laterally pivotable plate secured to said toe jaw and extending between said toe jaw and said automatic heel portion means a distance less than the spacing therebetween and from said toe jaw at least to a location beneath the ball of the foot of a skier when said ski boot is disposed in said safety ski binding between said toe jaw and said automatic heel portion means, said plate including an upwardly extending portion having a substantially vertical surface defining abutment means;

stop means arranged on the underside of said plate in longitudinally spaced, confronting relation with said abutment means;

counter support means fixed to the ski and arranged beneath said plate in non-contacting relation with the sole of said ski boot, said counter support means having a substantially vertical surface means engaging between said abutment means and said stop means for preventing movement of said plate along the longitudinal axis of the ski and for permitting lateral movement of said plate relative to said counter support means;

bearing means cooperating with said plate for enabling lateral pivotal movement of said plate about a point longitudinally spaced from said counter support means;

means for releasably fastening the plate to the ski, said fastening means comprising a spring-loaded locking means arranged forwardly of and cooperating with said plate for enabling lateral pivotal movement of said plate.

4,073,510

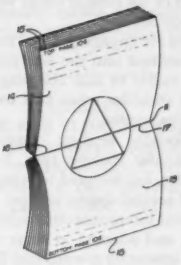
LARGE PRINT BOOKS AND METHOD FOR PRODUCING THE SAME FROM REGULAR SIZE BOOKS

John A. Scharlin, 510 E. Andover Drive, Burbank, Calif. 91504

Filed Sept. 15, 1975, Ser. No. 613,620

Int. Cl.² B42C *1/00*

U.S. Cl. 281—15 R **7 Claims**



5. A method of producing a large print size book from a book originally of smaller print size, comprising providing a specimen of the top half of each side of each book page and a specimen of the bottom half of the same side of each book page, placing the specimen of the bottom half of each book page above the specimen of the top half of the next succeeding page with the bottom and top halves arranged in a predetermined relation to each other, making an enlarged copy on a one-piece sheet of each combination of bottom and top half specimens arranged in such predetermined relation, folding each sheet in half to provide an outer folded edge of each enlarged sheet and inner free edges, and binding said free edges of said sheets together.

4,073,511

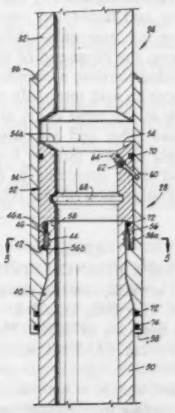
COUPLING ASSEMBLY FOR SUBMARINE CASING SECTIONS

Billie G. Haas, and Carol B. Haas, both of 3232 S. Madole, Oklahoma City, Okla. 73159

Filed July 22, 1976, Ser. No. 707,830

Int. Cl.² F16L *35/02*

U.S. Cl. 285—3 **10 Claims**



1. A coupling assembly for coupling spaced aligned casing sections together comprising:

an external coupling sleeve having a first open end adapted to telescopingly engage an open end of a first casing sec-

tion, and having a second open end adapted to telescope over an open end portion of a second casing section, said coupling sleeve further including annular shoulder means spaced inwardly from the second open end thereof;

an internal tubular collar slidably positioned in said external coupling sleeve and including:

an annular locking ring forming an end of said tubular collar bearing against said annular shoulder and movable as a part of the tubular collar with the remainder of the tubular collar; and

engaging means for engaging a tool extended through the first casing section into the internal collar to facilitate sliding said collar in said coupling sleeve away from said annular shoulder when said tool is pulled toward the first casing section;

an expandable locking element constrictively positioned within said annular locking ring, bearing against said annular shoulder, and adapted to interlock with the outer surface of said second casing section; and

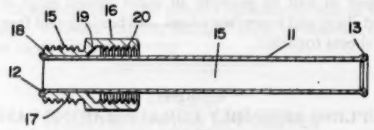
a shearable element interconnecting said sleeve and internal tubular collar, and adapted to shear when said collar is slidably urged upwardly toward said first open end of said coupling sleeve to a position free of said locking element.

4,073,512

QUICK CONNECT DEVICE FOR AUTO RADIATORS

David Roy Vian, Rialto, and Stephen Glenn Price, Riverside, both of Calif., assignors to Hayden Trans-Cooler, Inc., Oakland, Calif.

Filed Dec. 9, 1976, Ser. No. 748,902
Int. Cl.[2] F16L *25/00*
U.S. Cl. 285—12 **1 Claim**



1. A device for connecting a fluid carrying line to either a male or female threaded connector, comprising a tube provided with a flared portion at each end thereof; an adapter coupling having a bore extending therethrough, the diameter of said bore being less than the diameter of said flared portion at each end; said tube being slidably received in said bore and retained therein by said flared end portions; one end of said coupling including an externally threaded portion and a smooth interior bore, the other end of said coupling including an internally threaded portion; a chamfer extending from said smooth interior bore to said internally threaded portion, said chamfer extending at the same angle as the respective flared end portion of said tube; and an outwardly directed taper extending from said smooth interior bore to said one end of said coupling, said taper extending at the same angle as the respective flared end portion of said tube.

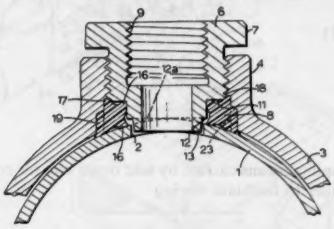
4,073,513

PIPE BRANCH FITTING

James Blakeley, Thornhill, Canada, assignor to Blakeley Engineering Limited, Thornhill, Canada

Filed Sept. 24, 1976, Ser. No. 726,289
Int. Cl.[2] F16L *41/00*
U.S. Cl. 285—93 **6 Claims**

1. In combination, a pipe, an embracement member having a cylindrical inner surface in embracement around the pipe at a point where the pipe has a pre-cut hole, an upstanding, hollow, internally threaded boss on one side of the member, a resilient sealing gasket at the inner side of the boss, a fitting part threaded in the opening having a planar annular surface bearing rotatably on the gasket and being formed at its inner end with a reduced width spigot portion positioned in the pre-cut hole and at its outer end with a nut extending above the boss so that the fitting part can be turned by a wrench to displace the fitting part inwardly to compress the gasket against the pipe, the spacing between the nut and the upper end of the boss serving to indicate visually the extent of inward movement of the fitting part, and an inward-facing shoulder on the spigot end portion for abutment on the outer surface of the pipe



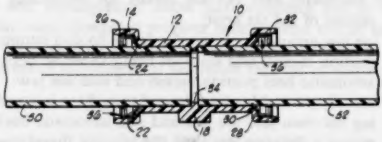
within said gasket whereby the compression applied to the gasket is restricted to a predetermined limit, the spigot end portion extending a short distance beyond said inward-facing shoulder, the gasket having at least one annular upper surface portion lying in a single transverse plane and a saddle-shaped lower surface conforming to the surface of the pipe around the pre-cut hole and being confined between and in substantially complete conformity with the adjacent surfaces of the fitting part, the embracement member and the pipe.

4,073,514

COMBINATION PIPE FITTING AND RETAINER RING

Harold T. Pate, Solon, Ohio, assignor to Indian Head Inc., New York, N.Y.

Filed May 26, 1976, Ser. No. 690,156
Int. Cl.[2] F16L *25/00*
U.S. Cl. 285—127 **30 Claims**



1. In combination, a pipe fitting and retainer ring comprising:

a fitting having a hollow interior defined by an internal wall, and having an opening in one side thereof communicating with said hollow interior, said fitting further defining an interior seat on said hollow internal wall and extending around said hollow interior;

a spring metal retainer ring in said fitting around said hollow interior and including:

a continuous, endless band seated on said seat;

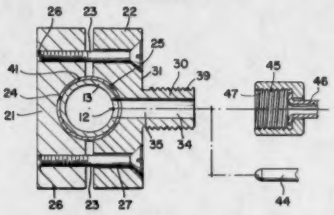
a plurality of spaced anchor tabs projecting outwardly from said band in a direction generally away from the hollow interior of said fitting and in the direction of said opening into the hollow interior; and

a plurality of pipe-gripping tabs projecting from said band inwardly into said hollow interior and collectively disposed around said hollow interior, said pipe-gripping tabs further projecting from said band in a direction away from said opening and protruding radially inwardly from said seat to a protuberant inward position for engagement with the outer surface of a pipe inserted into said fitting; and

means on said internal wall cooperating with said anchor tabs to prevent shifting of the band and anchor tabs of said

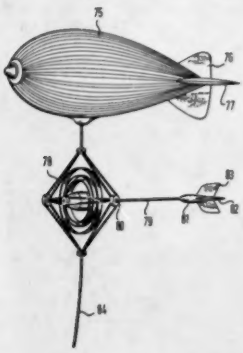
spring metal retainer ring in relation to said fitting while allowing a pipe to be inserted through said spring metal retainer ring by deflection of said pipe-gripping tabs.

4,073,515
ATTACHABLE PIPE TEE
Armand Perera, Bristol, Conn., assignor to The Raymond Lee Organization, Inc., New York, N.Y.
Filed Jan. 17, 1977, Ser. No. 759,785
Int. Cl.² F16L *41/00*
U.S. Cl. 285—158 **1 Claim**



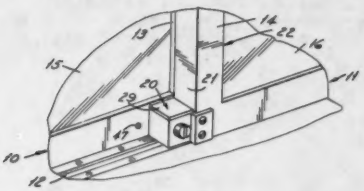
1. A kit for joining an extension tube to a pipe comprising
a pair of clamp members, each formed with a curved recess on an inner face of a shape to engage a cylindrical pipe wall,
attachment means to fasten both clamp members about a pipe, with
one of said clamp members formed with a threaded nipple that extends from an external face of said clamp member,
said nipple formed with a through circular hole of smooth bore that extends to the face of the curved recess, with
a collar internally threaded to engage the thread of the nipple, said collar adaptable for fastening a length of tube to said nipple, together with a length of solid flat sealing tape adaptable for wrapping about the outer wall of the pipe and between said pipe wall and the recess of each clamp member, when the clamp members are mounted about a section of said pipe, with the sealing tape fixed between the clamp members and said pipe, such that the pipe and the wrapped tape may be pierced simultaneously by a tool inserted into the axial hole of the nipple.

4,073,516
WIND DRIVEN POWER PLANT
Alberto Kling, Am Hugel 14, D-8136 Percha, Germany
Filed June 6, 1975, Ser. No. 584,354
Int. Cl.² F03D *9/00*
U.S. Cl. 290—55 **11 Claims**



1. A wind-driven power plant comprising current generator, a rotor assembly comprising at least one pair of coaxially and coplanarly mounted counter-rotating rotors having their moments of momentum compensated, at least one rotor being coupled to said current generator, a support means supporting said rotor assembly and current generator, means for aligning said rotor assembly in the wind direction, at least one captivating stay and an anchorage means, said support means comprising at least one aerostatic suspension body carrying its own weight as well as the weight of the rotor assembly, current generator, and alignment means and said suspension body being connected through said captivating stay to said anchorage means.

4,073,517
LOCK FOR SLIDING DOORS
Marius W. Bills, 16220 Schoolcraft, Detroit, Mich. 48227
Continuation of Ser. No. 618,620, Oct. 1, 1975, abandoned. This application Mar. 4, 1977, Ser. No. 774,458
Int. Cl.² E05C *5/02*
U.S. Cl. 292—60 **14 Claims**



1. In a sliding door, the combination comprising
a first door having a frame with a side surface and a front surface,
a second sliding door having a frame,
a lock mounted on said frame of said second door,
said lock having a housing engaging the side surface of the frame of said second door,
said housing having an inner wall adjacent the frame of the first door and an outer wall,
an intermediate wall between said inner and outer walls,
said intermediate wall being positioned closely adjacent said outer wall to define a space between said intermediate wall and outer wall,
a plunger,
said outer, intermediate and inner walls having aligned openings therein through which the plunger extends,
means yieldingly urging the plunger inwardly,
the opening in the outer wall having a noncircular configuration,
the opening in said intermediate wall having a substantially similar configuration but circumferentially oriented with respect to the opening in said outer wall,
said plunger having a laterally extending projection along a portion of the length thereof corresponding substantially to the configuration of the openings in said inner and outer wall,
the axial distance between the outer wall and the intermediate wall being substantially equal to the axial length of the laterally extending projection on said plunger,
said first door having an opening therein into which the plunger is adapted to extend,
such that the plunger may be held outwardly out of locking position by moving the plunger and rotating the same so that the projection thereon moves through the opening in the intermediate wall and the opening in the outer wall and engages the outer surface of the outer wall and the lock may be engaged by rotating the plunger such that the projection is aligned with the opening in the outer wall permitting movement of the plunger under the action of the spring means through the opening in the outer wall

and thereafter further rotation of the plunger brings the projection into alignment with the opening in the intermediate wall to permit movement of the plunger and the projection thereon through the opening in the intermediate wall so that the plunger engages the opening in the first door and further rotation moves the projection on the plunger so that the plunger is held against movement axially outwardly by engagement of the projection thereon with the inner surface of the intermediate wall,

the distance between said projection and the end of said plunger being greater than the distance from the space between said intermediate wall and outer wall to the inner wall such that when said plunger is in position with said projection in the space between the intermediate wall and outer wall, the end of said plunger extends beyond said inner wall and is in engagement with the opening in the first door.

4,073,518

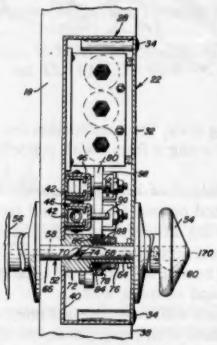
ELECTRICALLY AND MANUALLY ACTUATABLE DOOR LOCKING STRUCTURE

Charles M. Goodwin, Rte. No. 2, Mount Vernon, Ohio 43050

Filed May 28, 1976, Ser. No. 691,144

Int. Cl.[2] E05B *47/06*

U.S. Cl. 292—144 **7 Claims**



1. A lock including a housing, a lock bar supported from said housing for longitudinal reciprocation between limit positions with one end extended and retracted relative to said housing, lock means shiftably supported from said housing for movement between locking and unlocking positions, said lock means and bar including coacting portions abuttingly engageable with each other to prevent shifting of said bar from said extended position toward said retracted position when said lock means is in said locking position, and operator means operative from the exterior of said housing for shifting said lock means between said locking position and said unlocking position, said operator means including a doorknob assembly journaled through said housing and having operating arm means mounted thereon for oscillation therewith, said arm means being operatively associated with said bar for reciprocating the latter in response to oscillation of said doorknob assembly, said doorknob assembly including a sleeve assembly extending through said housing and having door inner and outer knobs mounted on its opposited ends, said inner knob being secured on said sleeve assembly by means of a through bolt extending through said sleeve assembly and threadedly engaged with said outer knob, said sleeve assembly including opposite end sleeve sections journaled through opposing walls of said housing, said operating arm being carried by a connecting sleeve member into whose opposite ends the adjacent ends of said sleeve sections are telescoped, said operating arm being rotatably mounted on said connecting sleeve and said connecting sleeve and operating arm including coacting slip clutch means connecting said operating arm to said connecting sleeve for oscillation therewith.

4,073,519

NOISELESS LATCH FOR PARTICULAR USE ON VEHICLE DOORS

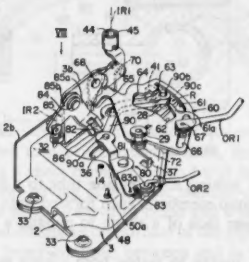
Toshio Kurozu, Chigasaki, and Yoshikazu Hamada, Tokyo, both of Japan, assignors to Mitsui Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 13, 1976, Ser. No. 676,612

Claims priority, application Japan, Dec. 26, 1975, 50-177775[U]

Int. Cl.[2] E05C *3/06, 3/16*

U.S. Cl. 292—216 **13 Claims**



1. A latch comprising a main body defining therein a striker guideway into and out of which a striker is movable, a latching member rotatably disposed across the striker guideway within the main body and having a recess for engagement with the striker, means for controllably restraining the latching member from rotation in one direction, a shaft rotatably supporting the latching member, and a noise suppressor member of resilient material substantially integrally attached to the latching member so as to define part of the recess, said noise suppressor member being so arranged on the latching member as to collide with the striker upon entrance thereon into the striker guideway, said noise suppressor member comprising a mounting plate having a hole for receiving said shaft and a noise suppressor proper formed integral with the mounting plate and secured directly to the latching member.

4,073,520

LATCH MECHANISM

Yoshimasa Tsuchiya, Sayama, and Hiroshi Fujii, Niiza, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed July 21, 1976, Ser. No. 707,402

Claims priority, application Japan, Aug. 31, 1975, 50-105275

Int. Cl.[2] E05C *3/26*

U.S. Cl. 292—216 **1 Claim**

1. In a vehicle having a vehicle body;

a body element;

a member hinged to the vehicle body and overlapping said body element;

a compressible seal disposed between said body element and said member;

a keeper secured to one of said body element and said member;

a latch plate secured to the other one of said body element and said member, said latch plate having spaced walls defining a keeper receiving slot extending inwardly from the edge thereof, said walls defining an inner section having approximately parallel spaced sides for the reception of said keeper therebetween and a section having outwardly diverging sides for guiding said keeper to said inner section;

a latch member pivotally mounted on said latch plate for rotation between a latched and an open position;

a latch spring mounted on said latch plate urging said latch member toward the open position;

a detent pivotally mounted on said latch plate, said detent having a detent arm positioned to engage the perimeter of said latch member and an actuating arm;

a detent spring mounted on said latch plate urging said detent arm against the perimeter of said latch member;

said latch member having a latch portion, said latch portion having spaced recess walls defining a recess in an edge thereof, one of said recess walls being disposed across said keeper receiving slot in the path of said keeper entering said keeper receiving slot for rotation of said latch member to the latched position against the force of said latch spring in response to movement of said keeper into said keeper receiving slot, the opposite recess wall being positioned to move across said keeper receiving slot behind said keeper as said latch member moves toward the latched position to confine said keeper within said keeper receiving slot;

said opposite wall having a slanted face which is inclined with respect to a plane perpendicular to a line along which said keeper moves to provide an arrangement in which, when said member hinged to the vehicle body overlaps said body element, said compressible seal is compressed to bias said keeper within said keeper receiving slot toward said slanted face to urge said keeper into firm engagement with one of said approximately parallel spaced sides.

4,073,521

CLOSURE LOCK WITH INFLATABLE BLADDER

Joseph M. Mena, 1961 Greenfield Drive, West Covina, Calif. 91792

Filed Aug. 30, 1976, Ser. No. 718,591
Int. Cl.[2] E05C *21/02*
U.S. Cl. 292—256.65 **16 Claims**

1. The combination comprising:

a frame structure containing an opening;

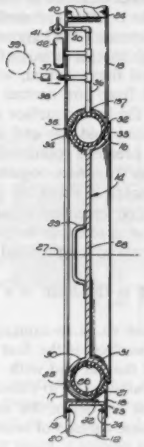
a closure structure movable relative to said frame structure between a closed position of extension across said opening and an open position;

an inflatable bladder operable by inflation to lock said closure structure against opening movement and by deflation to permit such opening movement;

said bladder being carried by one of said structures and being engageable when inflated with a shoulder on the other structure in a relation blocking opening movement of the closure structure; and

control means operable from a first side of said frame and closure structures to apply pressure fluid to the bladder and thereby lock the closure against opening movement, and to release pressure fluid from the bladder and permit opening of the closure;

said structures being constructed to block off all access to the bladder from a second side of said structures by puncturing instruments, and thereby positively prevent unauthorized opening of said closure structure from said second side.

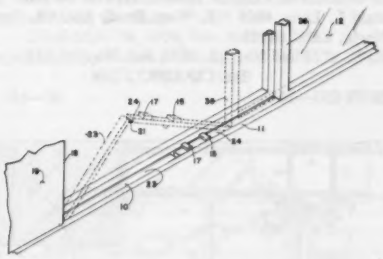


4,073,522

SECURITY STEP OR STOP FOR SLIDABLE DOOR

Timothy P. Tierney, Hazlet, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Nov. 9, 1976, Ser. No. 740,171
Int. Cl.[2] E05C *17/08*
U.S. Cl. 292—262 **1 Claim**



1. A unit formed of a first bar hinged to a second bar that serves as a security stop for the prevention of opening of a slidable door, when placed on the track of a said slidable door with the lower surface of each bar resting on said track in an extended position of said bars,

said bars joined together by hinge at a first end of each bar so that both bars may be folded in a first circular direction about the pivot axis of the hinge from a first extended position in which a longitudinal axis of each bar forms a common straight line, to a second position in which said axes form two generally parallel lines with the lower surface of each bar facing each other, with means to prevent said bars in said first extended position from rotating to said second position in response to a longitudinal force applied against the opposed end surfaces of the bars, and permanent means to prevent said bars from rotating in said first extended positon in a second circular direction about the pivot axis of the hinge that is contrary to said first circular direction, in which

one of the bars is fitted with means to lengthen the distance

from the hinge to the external end surface of the said bar, and in which

the opposed lower end surfaces of the two bars are each recessed so that the bearing end surface of each said end surface does not intersect the longitudinal axis of the bar that passes through the pivot axis of the hinge when the bars are in the said first position, with said longitudinal axis being spaced from the central longitudinal axis of each bar towards the lower surface of each bar so that a bearing force against said bar end surfaces, in said first extended position, creates a rotational movement contrary to said first circular direction, together with

pivotable means mounted to a first bar which causes the bars to rotate in said first extended position in the said first circular direction so as to cause the pivot axis of the hinge to move past the central longitudinal axis so as to unlatch hinge joint,

said pivotable means in the form of a kicker plate formed with

a first section located so as to contact a base surface on which the lower surface of the first bar rests, in the extended position of the bar and with

a second section located so as to extend beyond the upper profile of said first bar when the said first section is in contact with the base surface of which the first bar rests, with

said kicker plate pivotally mounted to said first bar along a pivotal axis with the said first section located between the said pivotal axis and the second section such that

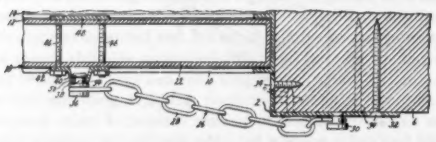
foot pressure applied against said second section towards the base surface, when the bars are in the extended position and resting on said base surface, causes the pivot axis of the hinge to move away from said base surface so that the two bars may fold together to rotate towards the second position in response to a longitudinal applied force against bearing end surfaces of the two bars.

4,073,523

CHAIN LOCK FOR SLIDING DOORS

Donald L. Long, 4806 NE. Winn Road, Apt. 6B, Kansas City North, Kans. 64119

Filed Nov. 11, 1976, Ser. No. 740,824
Int. Cl.[2] E05C *17/36*
U.S. Cl. 292—264 **1 Claim**



1. In combination with a sliding door including a vertical, generally planar panel horizontally movable in its own plane in a door frame, a vertical edge of said panel being movable into telescoping engagement with a channel member forming an element of said door frame to close said door, a door lock comprising:

a. a strong linked chain adapted to be extended generally horizontally and parallel to the plane of said panel to bridge the juncture of said panel and said frame channel when said panel and channel are in telescoped relation, and

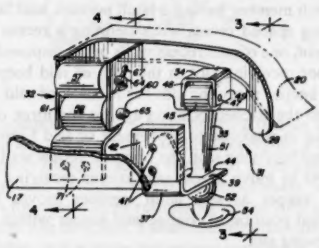
b. means operable to secure the opposite ends of said chain to said panel and to said door frame, the means connecting one of said chain ends to said door frame constituting a right angled plate to which said chain is permanently connected and which embraces a vertical corner of said door frame, and screw-type fasteners securing both of the right-angled plate legs to said door frame, whereby the fasteners associated with the respective plate legs are disposed at right angles to each other; and the means connecting the other of said chain ends to said panel constituting a button affixed to said other chain end and including a neck projecting therefrom laterally of the general extent of said chain and having an enlarged head at its extended end, and a plate affixed to said panel, said plate having a vertical slot formed therethrough, the upper end portion of said slot being large enough to admit said head, and the lower end portion of said slot being of reduced size so as to pass said neck but not said head therethrough, the end connections of said chain to said panel and said door frame being so spaced, relative to the length of said chain, that said panel cannot be moved out of its telescoped engagement with said channel when said chain is connected to said panel.

4,073,524

RESTRAINT ASSEMBLY FOR A TRACTOR HOOD

Albert Gianessi, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 13, 1976, Ser. No. 714,426
Int. Cl.[2] E05C *3/04*
U.S. Cl. 292—341.12 **6 Claims**



1. In a fastening arrangement for securing a first element to a second element disposed adjacent to the first element including resilient latch means carried by one of said elements and resiliently engaging with the other of said elements to prevent the elements from being moved directly apart, a restraint assembly comprising a pair of spaced walls on the first element, one of said walls being integral with the first element, the other of said walls being defined by a generally Z-shaped bracket having one end portion fixed to the first element and having the other end portion spaced from and generally parallel to the first element to define a space, a pair of resilient rollers carried by the second element and adapted to be inserted into and to span said space between said walls, one of the rollers engaging one of said walls and the other of said rollers engaging the other of said walls to restrict the elements from slidable movement relative to each other.

4,073,525

DOOR LATCH SECURING DEVICE

Marcelo Gurule, 605 - 49th St. NW., Albuquerque, N. Mex. 87105

Filed June 9, 1977, Ser. No. 804,937
Int. Cl.[2] E05C *13/02*
U.S. Cl. 292—346 **3 Claims**

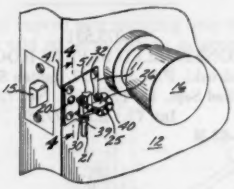
1. In a door lock including a latch bolt spring biased for latching a door and handle means for manual articulation of said bolt against the spring bias thereof, the improvement comprising:

a support plate adapted for attachment to the surface of said door in substantial alignment over said latch bolt, said plate including an opening in the face thereof aligned over said bolt and a clip structure extending from said plate proximate one horizontal edge thereof conformed in the manner of a substantially semicircular hoop segment adja-

cent said plate and a straight segment distal thereof substantially parallel to said plate;

a first and second bore formed respectively in said door and said latch bolt in axial alignment with said opening; and

a pin assembly including a pin extending from a handle, said pin being conformed for alternate receipt in said opening



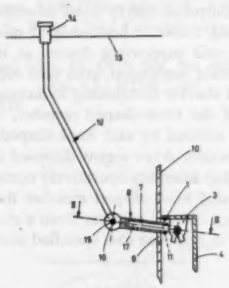
and first and second bores and in said hoop segment, and said handle including a detent extending radially from the axis of said pin conformed for receipt between said straight segment and said plate when said pin is inserted in the common interior of said opening and said first and second bore.

4,073,526

LOCK ARRANGEMENT FOR A MOTOR VEHICLE DOOR

Drago Sajfert, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed July 29, 1976, Ser. No. 709,913
Claims priority, application Germany, Aug. 16, 1975, 2536431
Int. Cl.[2] E05C *21/00*
U.S. Cl. 292—347 **9 Claims**



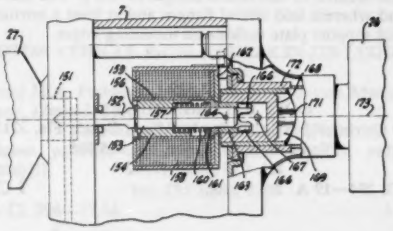
1. In a door having a lock arrangement mounted thereon, said lock arrangement including a lock mechanism mounted in said door and having a latch member which cooperates with a lock member fastened to a door column, a safety device, including a pivotal lever, associated with said lock mechanism, actuating means for said safety device, and means for releasably connecting the end portion of said actuating means facing said lock mechanism with a region of said pivotal lever which is oriented at least approximately in the direction toward the interior of said door; the improvement wherein: said actuating means includes a rigid member forming said end portion and a rod-shaped member which is articulated to said rigid member and is provided with an operating handle; means are provided for supporting said end portion of said actuating means against movement in the direction toward said interior of said door; and said means for releasably connecting said actuating means to said pivotal lever is a plug-in connection.

4,073,527

ELECTRICALLY CONTROLLED DOOR LOCK

Ernest L. Schlage, Burlingame, Calif., assignor to Schlage Lock Company, San Francisco, Calif.

Filed Jan. 12, 1977, Ser. No. 758,691
Int. Cl.[2] E05C *1/16*
U.S. Cl. 292—347 **14 Claims**



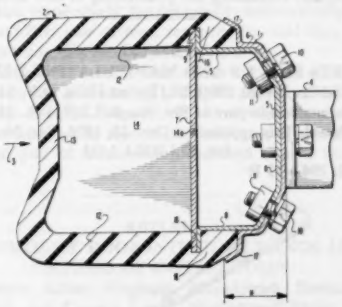
1. An electrically controlled door lock for use in a door panel having a bore therein comprising a lock chassis adapted to be disposed on said door panel, a lock bolt adapted to be disposed on said door panel, a spindle on said chassis rotatable about an axis, means for connecting said spindle to operate said lock bolt, a door handle, means for mounting said door handle on said door panel for rotation about said axis, a clutch including a member adapted to engage and to disengage said handle and said spindle, an electromagnet frame in said bore, an electromagnet on said frame, an armature operable by said electromagnet, and means for interconnecting said armature and said clutch member for conjoint movement.

4,073,528

BUMPER FOR MOTOR VEHICLES HAVING A SHOCK-ABSORBING PROFILE

Wolfgang Klie, Korntal, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Mar. 24, 1976, Ser. No. 669,753
Claims priority, application Germany, Mar. 25, 1975, 2513024
Int. Cl.[2] B60R *19/08*
U.S. Cl. 293—98 **14 Claims**



4. A vehicle bumper comprising:

(a) a hollow cross bearer;

(b) an impact absorbing hollow profile means;

(c) clamping means for mounting said hollow cross bearer at the vehicle;

(d) mounting means for mounting said impact absorbing hollow profile means at the hollow cross bearer on an impact-endangered side thereof, said mounting means including mounting edges provided on said hollow cross bearer extending transversely to a normal impact direction on said impact absorbing hollow profile means; and

(e) groove means extending in a longitudinal direction of the vehicle bumper provided in said impact absorbing hollow profile means for engaging said mounting edges;

wherein said hollow cross bearer includes a U-shaped profile member opening in a direction facing said impact absorbing hollow profile means, said U-shaped profile member including lateral flanges at each leg end thereof, and a support plate extending transversely of the impact direction secured to said lateral flanges of said profile member, and wherein said lateral flanges and at least a portion of said support plate define said mounting edges.

4,073,529

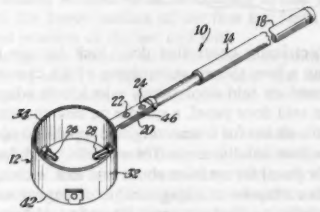
GOLF BALL RETRIEVER

Albert Ostrin, 441 NE. 195 St., N. Miami Beach, Fla. 33179

Filed Feb. 6, 1976, Ser. No. 655,895

Int. Cl.[2] A63B *47/02*

U.S. Cl. 294—19 A **1 Claim**



1. A device for retrieving a golf ball from a water hazard to recover a golf ball even if in unstable equilibrium comprising:

an elongated handle;

a cylindrical housing having an open top and bottom connected to one end of said handle;

three spring biased ball engaging gates which allow passage of a conventional golf ball through said housing in one direction from bottom to top, each gate pivotally mounted to the bottom inside of said housing disposed radially inwardly, the spring biasing force increasing gradually from a gate downlocked position to a ball passing engagement position whereby each of said ball engaging gates are biased to return to the downlocked position after passage of said ball within said housing,

a luminous material disposed on the top of said housing for optically enhancing the positioning of said housing.

4,073,530

PARTS PICK UP AND MANIPULATING DEVICES

David Seidler, 69-10 108th St., Forest Hills, N.Y. 11375

Continuation-in-part of Ser. No. 657,349, Feb. 11, 1976, abandoned. This application Dec. 23, 1976, Ser. No. 753,667

Int. Cl.[2] B25J *1/02*

U.S. Cl. 294—19 R **15 Claims**

1. A parts pick up and manipulating device for adhesive engagement with a part to be manipulated comprising a rigid handle portion, a pick up portion joined to said handle portion and a pressure sensitive adhesive applied to a selected area of said pick up portion, the extent of said area being selected in relation to the part to be picked up so that the part will not become disconnected during manipulation of the part, the part being disconnectable from the pick up portion by reducing the amount of said area in engagement with the part, said pick up portion being flexible throughout said area whereby the amount of said area in engagement with the part can be reduced by the flexing of said pick up portion through said handle.

4,073,531

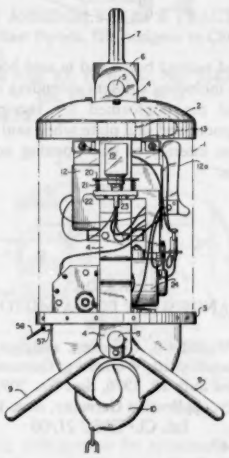
REMOTE-CONTROLLED SAFETY HOOK ASSEMBLY

Edward C. Androski, P.O. Box 627, Indian Spring, Nev. 89018

Filed Sept. 13, 1976, Ser. No. 722,816

Int. Cl.[2] B66C *1/38*

U.S. Cl. 294—83 R **84 Claims**



1. A remote-controlled safety hook assembly which comprises a supporting frame, a hook-shaped member rotatably disposed within said supporting frame, at least one rigid, spring-biased shackle suspended from said supporting frame, said spring-biased shackle functioning to increase the load-carrying capacity of the hook-shaped member, and to retrieve choker members utilized by said hook-shaped member in its load-carrying function, drive means disposed in said supporting frame and a gear assembly operatively connected with said drive mans and said hook-shaped member for automatically swinging said hook-shaped member from a closed position to an open position in response to a specified control signal.

4,073,532

ROUND BALE HANDLER

Calvin B. Blair, P.O. Box 97, Barnard, Kans. 67418

Filed June 9, 1976, Ser. No. 694,198

Int. Cl.[2] B66C *3/16*

U.S. Cl. 294—107 **1 Claim**

1. A device for handling large round bales of hay comprising:

(a) a frame having:

(1) a top beam,

(2) a bottom beam,

(3) first and second laterally spaced side beams being joined together in a rectangular arrangement with said top and bottom beams,

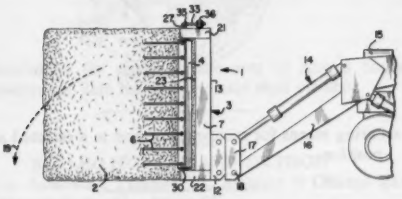
(4) projections extending from opposite ends of said first and second side beams, each of said projections having a bearing member, said bearing member being aligned along said side beam to which said bearing member is connected respectively,

(5) a bale engaging side;

(b) hitch means connected to said bottom beam of said frame for connection with hitch receiving members of a manipulating loader for rotating said frame between a horizontal position and a vertical position;

(c) first and second laterally spaced shafts having coaxial journals fastened at opposite ends of said shafts and a lever arm attached to each said shaft; said shafts being rotatably mounted on said bale engaging side of said frame by positioning said journals in said respective aligned bearing members;

(d) a plurality of curved bale engaging tines secured to and spaced along said respective shafts in generally opposed



relation for mutually penetrating spaced apart lines on the surface of said bale to a substantial depth; each said tine having a generally circular bale engaging portion of substantial arcuate length; each of said circular portion of said tines having an imaginary center generally coinciding with the longitudinal rotational axis of said respective shaft, whereby said circular portion penetrates into said bale without substantial deformation of the passageway formed in said bale by said circular portion; and

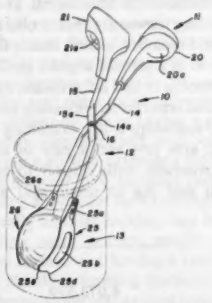
(e) motor means connected to said lever arms, thereby selectively rotating said shafts to effect engagement and disengagement between said tines and said bale when said frame is in either said vertical or horizontal position.

4,073,533

FOOD HANDLING TONGS

Robert J. De brey, 4502 Browndale Ave., Edina, Minn. 55424, and Richard S. Thom, 7941 Colorado Ave., Brooklyn Park, Minn. 55443

Filed Mar. 19, 1976, Ser. No. 668,593
Int. Cl.² B25B 5/04
U.S. Cl. 294—118 **9 Claims**



1. Tongs for handling food articles and the like, including:

a. a grasping portion including a pair of grasping elements, each said grasping element defining a generally rectangular, longitudinally extending section, said section defining an inwardly directed transverse curve and an inwardly directed longitudinal curve and a drainage aperture formed through said section;

b. a handle portion including a pair of handle elements;

c. a pair of longitudinally extending elements each respectively secured to a grasping element on one end thereof and a handle element on the other end thereof;

d. said support elements being pivotally connected to provide a scissor type connection therebetween; and,

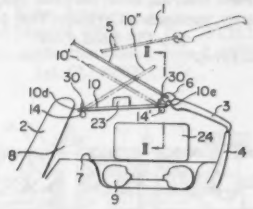
e. said pair of handle elements including a thumb receiving element having a passage arranged therethrough generally parallel to said support element and a finger receiving element having a passage arranged therethrough generally parallel to said support element.

4,073,534

MOTOR VEHICLE WITH A SHELF IN ITS LUGGAGE COMPARTMENT

Kazumi Hira, Fujisawa, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Aug. 2, 1976, Ser. No. 710,720
Claims priority, application Japan, Sept. 5, 1975, 50-122408[U]
Int. Cl.² B60R 3/08
U.S. Cl. 296—37.16 **1 Claim**



1. In a motor vehicle:

a seat with a seat back;

an open luggage compartment behind said seat back, said open luggage compartment having two transversely spaced side panels which form part of walls surrounding said luggage compartment;

a shelf, in the form of a flat panel, having a first pair of pins laterally projecting, in the opposite directions, from a first end portion said flat panel, and a second pair of pins laterally projecting, in the opposite directions, from a second end portion opposite to the first end portion;

a first pair of means fixed relative to said side panels, respectively, and having U-shaped members made of a resilient material, respectively, for detachably and rotatably retaining said first pair of pins, respectively, said first pair of means being disposed adjacent said seat;

a second pair of means fixed relative to said side panels, respectively, and having U-shaped members made of a resilient material, respectively, for detachably and rotatably retaining said second pair of pins, respectively, said second pair of means being disposed remote from said seat.

4,073,535

AUTOMOBILE ROOF INTERIOR LININGS AND METHOD OF INSTALLATION

Franz-Werner Alfter, Siegburg; Hans-Ulrich Breitscheidel, Troisdorf, and Cosmas Lorry, Niederkassel-Rheidt, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

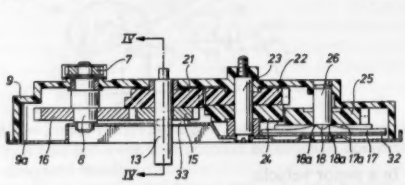
Filed Mar. 24, 1975, Ser. No. 561,167
Claims priority, application Germany, Apr. 10, 1974, 2417491
Int. Cl.² B60J 7/00
U.S. Cl. 296—137 A **21 Claims**

1. An interior lining arrangement for vehicles having a roof structure, said arrangement comprising a roof strut member forming a gap with the interior side of a vehicle roof, a non-self-supporting lining means at least partially adhesively secured to said roof for providing interior lining for said vehicle

roof, said lining means having at least one free edge passing through said gap, and profiled strip means adjacent said gap for clamping a part of the lining means immediately adjacent to said free edge against said roof strut member at said gap, said

profiled strip means being a profiled, continuous elongated member of elastic, compressible material, said elongated member being disposed along the entire length of said gap extending around the interior periphery of said vehicle roof.

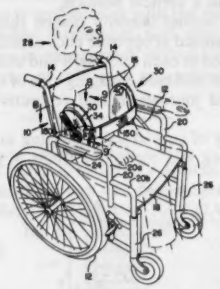
4,073,536
MOTOR VEHICLE ROOF
Walter Schlitzler, Aufhausen, Germany, assignor to Webasto-Werk W. Baier GmbH & Co., Stockdorf, Germany
Filed Dec. 22, 1976, Ser. No. 753,307
Claims priority, application Germany, Dec. 24, 1975, 2558764
Int. Cl.[2] B60J *7/04*
U.S. Cl. 296—137 G **31 Claims**



1. Movable vehicle panel member apparatus comprising:
a vehicle panel member,
driving means for tiltingly and slidingly moving said panel member with respect to adjacent vehicle structure,
a movement control member operatively engageable and movable with said driving means for limiting movement of said panel member as a function of the position of said movement control member,
and resiliently biased stop means engageable with said movement control member to retain said movement control member in a predetermined control member position corresponding to a predetermined panel member position,
wherein said stop means is configured and arranged to permit movement of said movement control member from said predetermined control member position in response to application of a predetermined moving force at said driving means which overcome the resilient bias of said stop means.

4,073,537
UNIVERSAL SUPPORT PADS FOR WHEELCHAIR
Don D. Hammersburg, 3516 NE. 119th Ave., Vancouver, Wash. 98662
Filed Sept. 23, 1976, Ser. No. 725,692
Int. Cl.[2] A62B *35/00*
U.S. Cl. 297—384 **14 Claims**

1. A device for positioning a patient in a chair having a back and arms, said device comprising
body engaging pad means,
attaching means for attachment to the underside of an arm of the chair and for movement along said arm toward and away from the chair back,
means for securing said attaching means in a selected position on said chair arm,
connecting means operatively connecting said pad to said attaching means accommodating universal movement of the pad relative to said attaching means to place said pad in a selected position relative to said chair for patient positioning, and



securing means for securing said pad in a selected adjusted position.

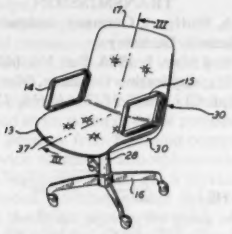
4,073,538
ARM STRUCTURE FOR RECLINING SEAT
George Taylor Hunter, Rte. 3, Box 250, Howe, Ind. 46764
Filed Jan. 3, 1977, Ser. No. 756,171
Int. Cl.[2] A47C *7/54*
U.S. Cl. 297—417 **8 Claims**

1. An arm structure for a reclining seat having a back pivoting from a substantially vertical position to a reclining position, comprising a member for attachment to a lateral side of the back and extending forwardly therefrom, an arm rest pivotally connected to said member, a latch means for retaining said arm rest selectively in at least two angular positions with respect to said back, and means in said latch means operable by a forward movement of said arm rest for releasing said arm rest for angular movement, including a lug extending longitudinally with respect to said arm rest and a pair of arm positioning pins positioned transversely with respect to said arm rest for engagement with said lug to retain said arm rest in selected positions.

4,073,539
BONDED CHAIR CONSTRUCTION
Jerome Caruso, Lake Forest, Ill., assignor to Litton Business Systems, Inc., York, Pa.
Filed May 27, 1976, Ser. No. 690,547
Int. Cl.[2] A47C *7/02*
U.S. Cl. 297—455 **11 Claims**

1. An article of seating comprising:
a shell member; and
a skin member in contact with said shell member;
said skin member being attached to the side of said shell

member oppositely of the side of said shell member closest to the body of a seated user by laminating throughout



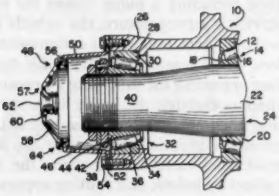
substantially the entire surface area of mutual contact between said skin member and said shell member.

4,073,540

SEALED HUB CAP AND METHOD

Ronald A. Jackowski, Palatine, Ill., assignor to Chicago Rawhide Manufacturing Co., Elgin, Ill.

Filed Jan. 28, 1976, Ser. No. 652,900
Int. Cl.² B60B *27/00*
U.S. Cl. 301—108 A **9 Claims**



1. A hub cap assembly comprising, in combination, a rigid hub cap body having a generally axially extending sidewall portion, a radially outwardly extending mounting flange formed on one axial end of said sidewall, means on said mounting flange for accommodating a cap fastener, and a radially inwardly extending, window-receiving flange portion, said window-receiving flange portion including inner and outer axially directed surfaces and an inner edge defining an opening in said body, a window unit including a transparent central panel and a mounting portion comprising first and second annular, generally axially extending window-mounting flanges being spaced radially apart from each other so as to define therebetween an annular seal-receiving groove, said first window-mounting flange having an axially facing end portion snugly received against said outer axially directed surface, and said second window-mounting flange having a portion extending through said body opening, and said second window mounting flange having a portion extending through said body opening and having at least two surfaces lying in different planes, thereby forming a shoulder for receiving and locating a locking ring, a generally annular locking ring having a generally radially extending outer portion snugly engaging said inner axially directed surface and having a radially inner portion bonded to said shoulder forming portion of said second window mounting flange along said at least two surfaces forming said shoulder, and a seal ring disposed in said seal-receiving groove, said outer portion of said locking ring and said first window-mounting flange cooperating to compress said seal ring axially thereof between a portion of said groove and said outer axially directed surface, and thereby establishing an oil-tight seal between said cap body and said window unit.

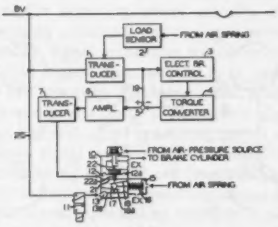
7. A method of forming a seal in a hub cap assembly, said method including providing a rigid hub cap body having a generally axially extending sidewall portion and a radially inwardly extending, window-receiving flange portion having inner and outer axially directed surfaces and an inner edge defining an opening in said body, providing a window unit having a transparent central panel and a mounting portion comprising first and second annular, generally axially extending window-mounting flanges spaced radially apart from each other and defining therebetween an annular seal receiving groove, positioning a seal ring within said seal receiving groove, positioning said window unit such that the axial end face portion of said first window-mounting flange snugly engages said outer axially directed surface, such that said seal ring is compressed between a portion of its receiving groove and said outer surface, and such that a portion of said second window-mounting flange extends axially through said opening, and ultrasonically deforming said portion of said second window-mounting flange radially outwardly into a position of snug engagement with said inner axially directed surface.

4,073,541

ELECTRO-PNEUMATIC CONTROL APPARATUS FOR AN ELECTRIC/FRICTION BRAKE BLENDING SYSTEM

Minoru Nagase, Kobe, Japan, assignor to The Nippon Air Brake Company, Ltd., Kobe, Japan

Filed May 16, 1977, Ser. No. 797,102
Claims priority, application Japan, June 2, 1976, 51-72003
Int. Cl.² B60T *13/74*
U.S. Cl. 303—3 **5 Claims**



1. A brake blending control system for a vehicle having electric and friction brake apparatus, said control system comprising:

(a) means for providing a fluid pressure brake command signal representing the desired degree of vehicle braking to be provided by said electric and friction brake apparatus;

(b) said electric brake apparatus being operative responsive to said brake command signal;

(c) means for providing a fluid pressure friction brake control signal comprising:

(i) means for providing an electric feedback signal representing the effective brake effort produced by said electric brake apparatus in response to said brake command signal;

(ii) first transducer means for converting said fluid pressure brake command signal to a corresponding electrical quantity;

(iii) comparison means for providing an error signal in accordance with the difference between said electrical quantity representing said brake command signal and said feedback signal representing the effective electric brake effort; and

(iv) second transducer means for converting said error signal to a corresponding fluid pressure signal to provide said friction brake control signal; and

(d) a fluid pressure operated relay valve device having a first control port to which said friction brake control signal is connected, a second control port to which said brake command signal is connected, and a delivery port, said relay valve device being operative responsive to pressurization of said first or said second control port to provide

fluid brake pressure via said delivery port to effect operation of said friction brake apparatus; and

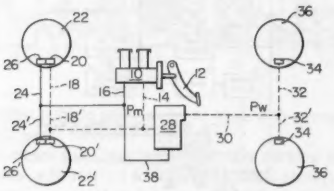
(e) valve means for normally cutting off said brake command signal from said second control port and for connecting said brake command signal to said second control port in response to a malfunction of said means providing said friction brake control signal.

4,073,542

FLUID PRESSURE CONTROL DEVICE AND MOTOR VEHICLE BRAKING SYSTEM INCORPORATING SUCH DEVICE

Keiichiro Yabuta, and Yoshitaka Koike, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Japan

Continuation of Ser. No. 540,001, Jan. 10, 1975, abandoned, which is a continuation of Ser. No. 305,040, Nov. 9, 1972, abandoned. This application Feb. 27, 1976, Ser. No. 662,228
Claims priority, application Japan, Nov. 13, 1971, 46-90986
Int. Cl.[2] B60T *8/26*
U.S. Cl. 303—6 C **3 Claims**



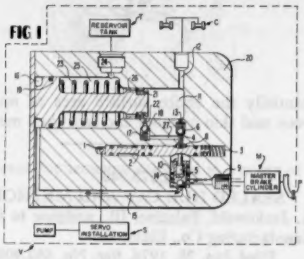
1. A motor vehicle hydraulic braking system comprising a master cylinder of a split type, a main fluid line leading from said master cylinder to rear wheel cylinders, as auxiliary fluid line leading from said master cylinder to front wheel cylinders, and a fluid pressure control device comprising a housing defining a cavity therein, which has an open end, an end plug which is fixedly attached to said housing to close said open end and is formed therein with large and small bores sealed from each other, said small bore communicating with said auxiliary fluid line to deliver fluid pressure into said small bore for threadedly attaching said end plug to said housing, an annular sealing member attached to a wall defining said cavity and dividing said cavity into a first chamber communicating with said main fluid line to deliver input fluid pressure thereinto and a second chamber communicating with said rear wheel cylinders, said first chamber being between said second chamber and said large bore, said large bore being sealed from said first chamber, said sealing member having an aperture formed therethrough, a plunger extending through said aperture and axially movable in said first and second chambers and said large bore and having an annular flange located in said chamber and engageable with said sealing member, said aperture providing an annular clearance between said sealing member and said plunger, and biasing means urging said plunger in a direction to disengage said annular flange from said sealing member, said plunger having a reduced end portion which is slidably fitted in said small bore and on which said fluid pressure in said small bore acts to urge said plunger in said direction, said end plug having further formed therein an air discharge passage opening into said large bore and outside said end plug for accomodating the axial movement of said plunger.

4,073,543

SWITCHING DEVICE FOR THE INDIRECT ALTERATION OF THE MECHANICAL BRAKE PEDAL TRANSMISSION

Reinhard Resch, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Mar. 1, 1976, Ser. No. 662,413
Claims priority, application Germany, Mar. 1, 1975, 2509077
Int. Cl.[2] B60T *11/28, 13/16, 17/18*
U.S. Cl. 303—10 **13 Claims**



1. A shifting apparatus for indirectly changing a transmission ratio of a mechanical brake pedal in case of a failure of a servo-assist of a motor vehicle brake-force servo-installation, the servo-installation including a pump means for pressurizing a medium to provide a servopressure, the vehicle brake system including wheel cylinders, brake lines communicating with the wheel cylinders, and a master brake cylinder communicating with the shifting apparatus for supplying a pressure medium to the wheel cylinders through the brake lines, characterized in that the shifting apparatus is installed at any desired place of the motor vehicle in communication with the brake lines as well as in brake lines extending between the master brake cylinder and wheel cylinders, said shifting apparatus including a control piston means actuated by the pressure medium from the pump means of the servo-installation for effecting a shifting control of a flow path of the pressure medium from the master cylinder in the shifting apparatus upon a failure of the servo-installation, and in that a differential piston means having at least one large cross-sectional area and small cross-sectional area is arranged in the shifting apparatus for controlling a pressure medium, a valve means arranged in the shifting apparatus for controlling a flow of the pressure medium therein from the master brake cylinder, said control piston means, said valve means and said differential piston means are arranged in the shifting apparatus such that said differential piston means in a normal operating condition is non-actuated by the pressure medium from the master brake cylinder and, upon a failure of the servo-installation, the pressure medium from the master brake cylinder acts upon the large cross-sectional area of the differential piston means by a pressure prevailing in the master brake cylinder so as to exert a pressure on the pressure medium in a brake line communicating with the wheel cylinders by the small cross-sectional area of the differential piston means with a hydraulic transmission.

4,073,544

CONTINUAL QUICK SERVICE VALVE DEVICE

James E. Hart, Trafford, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Mar. 23, 1977, Ser. No. 780,473
Int. Cl.[2] B60T *17/04*
U.S. Cl. 303—83 **10 Claims**

1. In a fluid pressure brake equipment, the combination of a brake pipe normally charged with fluid to a certain chosen pressure and a continual quick service valve device comprising:

(a) a control volume,

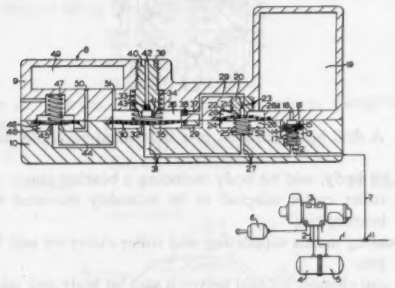
(b) choke means for controlling the rate of flow of fluid

under pressure from the brake pipe to said control volume whereby said control volume is charged with fluid under pressure from the brake pipe to the same pressure as that in the brake pipe,

(c) a quick service volume,

(d) a pair of fluid pressure operated valve means arranged in series for controlling flow of fluid under pressure from the brake pipe to said quick service volume, the first of said fluid-pressure-operated valve means being so arranged and constructed as to, when in a first position, enable flow of fluid under pressure from both said control volume and said quick service volume to atmosphere while cutting off flow from the brake pipe to said quick service volume and, when in a second position, enable flow of fluid under pressure from the brake pipe to the quick service volume while cutting off flow from both said control volume and said quick service volume to atmosphere, and the second of said fluid-pressure-operated valve means constituting a spring-biased valve for enabling flow from both the brake pipe and said control volume to said quick service volume while said first valve means is in its said second position,

(e) three choke means so arranged in series as to enable flow of fluid under pressure therethrough from said control volume to atmosphere while said first valve means is in its said first position, the first of said choke means being of such size as to enable the flow of fluid under pressure therethrough at a service rate of reduction of brake pipe pressure and so arranged as to, in cooperation with the



second of said choke means, establish a differential fluid pressure to cause said first fluid-pressure-operated valve means to operate from its first position to its second position, and the third of said choke means being of a size greater than the size of said second choke means and so arranged as to release fluid under pressure from said quick service volume to atmosphere while said first fluid-pressure-operated valve means is in its said first position independently of said first and second choke means, and

(f) a third fluid-pressure-operated valve means for controlling flow of fluid under pressure from said control volume to the first of said choke means, said third fluid-pressure-operated valve means comprising:

(i) a biasing means,

(ii) a valve seat, and

(iii) a movable abutment so arranged as to constitute a valve movable into and out of seating engagement with said valve seat, said abutment being subject on the side thereof adjacent said valve seat to the pressure in said control volume and on its other side to said biasing means and also the pressure of the fluid in the brake pipe so that a reduction of pressure in the brake pipe enables the fluid under pressure in the control volume to unseat said abutment from said valve seat whereby so long as said abutment is unseated from said valve seat, fluid under pressure flows from said control volume through said first and second choke means to establish said differential fluid pressure thereby enabling successive sequential operation of said pair of fluid-pressure-operated valve means to release fluid under pressure from the brake pipe to said quick service volume and thereafter release the fluid under pressure in said quick service volume to atmosphere.

4,073,545

VEHICLE BRAKE CONTROLLING DEVICE FOR ANTI-SKID CONTROL OF VEHICLE WHEELS

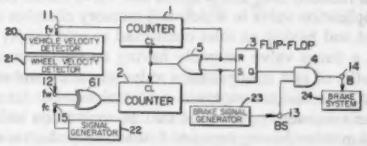
Yasuhisa Takeuchi, Yokosuka; Kenji Maio, Tokyo, and Junichiro Matsumoto, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited and Hitachi, Ltd., both of Japan

Filed Apr. 27, 1976, Ser. No. 680,864

Claims priority, application Japan, Apr. 30, 1975, 50-51392

Int. Cl.[2] B60T *8/10*

U.S. Cl. 303—109 **9 Claims**



1. A vehicle brake controlling device comprising first detection means for detecting vehicle velocity and providing a first output signal proportional to said vehicle velocity, second detection means for detecting wheel velocity of a vehicle wheel and providing a second output signal proportional to said wheel velocity, signal generating means for generating a fixed third output signal proportional to a predetermined wheel velocity at a low vehicle running speed, addition means for adding said second and third output signals of said second detection means and said signal generating means and providing a fourth output signal representing said addition, comparison means for comparing said first and fourth output signals of said first detection means and said addition means and providing a fifth output signal representing whether or not the ratio of said fourth output signal to said first output signal is less than a predetermined value, and control means for controlling a brake system in response to said fifth output of said comparison means.

4,073,546

ANTI-SKID VEHICLE BRAKING SYSTEM

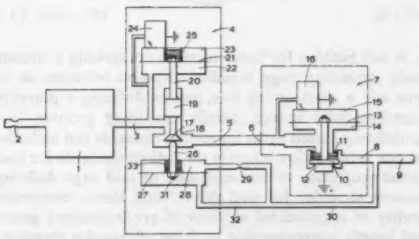
John Patrick Bayliss, Redditch, England, assignor to Girling Limited, Birmingham, England

Filed Aug. 12, 1976, Ser. No. 713,816

Claims priority, application United Kingdom, Aug. 30, 1975, 35854/75; May 11, 1976, 19240/76

Int. Cl.[2] B60T *8/02*

U.S. Cl. 303—115 **11 Claims**



1. A fluid pressure-operated anti-skid braking system for rail and other vehicles comprising at least one actuator for applying a wheel brake, a supply of operating fluid for operating said actuator, fluid flow control valve means interposed between said supply and said brake and through which fluid from said

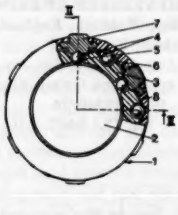
supply is supplied to said actuator, deceleration responsive means responsive to a skid signal for operating said valve means to relieve brake skid pressure applied to said actuator when the deceleration of said wheel is excessive and exceeds a predetermined value, a fluid pressure memory chamber for sensing said skid pressure applied to said actuator on the downstream side of said control valve means whereby said skid pressure sensed by said memory chamber can never exceed the said skid pressure applied to said actuator to cause excessive deceleration of said wheel, wherein said memory chamber provides a changeover point between first and second successive stages of re-application of fluid from said supply to said actuator, said first stage comprising re-application of said fluid at a normal original rate until an intermediate pressure less than said skid pressure is attained at said changeover point, and said second stage comprising continued re-application of said fluid but at a reduced rate, and wherein said valve means comprises a re-application valve in which said memory chamber is incorporated and having an inlet connected to said supply and an outlet, a dump valve assembly having an inlet connected to said outlet of said re-application valve assembly and an outlet connected to said actuator, and a control member for controlling the maximum opening of said re-application valve, said control member having opposed first and second areas exposed respectively to said memory chamber and to a second chamber on the opposite side of said control member from said memory chamber, first and second connections between both said chambers and said outlet of said dump valve assembly, and a first restrictor incorporated in said connection between said memory chamber and said outlet of said dump valve assembly, the arrangement being such that a difference in pressure between the said two chambers biasses said control member in a direction to reduce the maximum opening of said re-application valve.

4,073,547

BALL BUSHING FOR LINEAR MOTIONS

Bengt Lundgren, Ulricehamn, and Sven Walter Nilsson, Partille, both of Sweden, assignors to SKF Nova AB, Goteborg, Sweden

Continuation of Ser. No. 638,634, Dec. 8, 1975, abandoned. This application Dec. 21, 1976, Ser. No. 753,080
Claims priority, application Sweden, Jan. 22, 1975, 7500654
Int. Cl.[2] F16C *27/00*
U.S. Cl. 308—6 C **8 Claims**



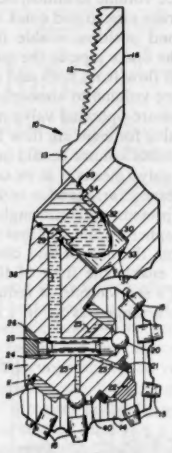
1. A ball bushing for linear motions comprising a circumferentially extending cage member disposed between an outer sleeve and a shaft or the like, means defining a plurality of circumferentially spaced, axially extending grooves in said cage defining closed paths for rolling elements and including at least one path portion wherein the rolling elements are loaded, a radial projection at one axial end of said cage defining an abutment shoulder for said sleeve, said sleeve comprising a plurality of longitudinal sections of predetermined generally equal length interengagable to form an annular member circumscribing the grooves in said cage, adjacent side edges of each section having a complementary close fitting grooves and ridges formed therein permitting assembly of the sections to form the annular member by relative axial displacement, detachable retaining means adjacent the opposite end of the cage adapted to confront one end of the sleeve opposite said radial projection thereby limiting axial displacement relative to the cage.

4,073,548

SEALING SYSTEM FOR A ROTARY ROCK BIT

D. F. Walters, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 1, 1976, Ser. No. 737,634
Int. Cl.[2] F16C *33/76*
U.S. Cl. 308—8.2 **3 Claims**



1. A drill bit for drilling in a fluid filled borehole, comprising:

a bit body, said bit body including a bearing pin;

a roller cutter adapted to be rotatably mounted on said bearing pin;

bearing means supporting said roller cutter on said bearing pin;

a seal element located between said bit body and said roller cutter;

a lubricant reservoir in said bit body;

lubricant passages extending from said lubricant reservoir to said bearing means;

lubricant in said lubricant reservoir, lubricant passages and between said bearing pin and roller cutter;

pressure equalization means within said lubricant reservoir for pressure equalization of said lubricant and said fluid in said borehole, said pressure equalization means encountering volume expansion of said lubricant; and

a groove for retaining said seal element, said groove having a wedge shaped sidewall surface that allows the volume expansion of said lubricant to move said seal element outward in said wedge.

4,073,549

HYDROSTATIC SUPPORTING DEVICE

Alfred Christ, Zurich; Rolf Lehmann, Mutschellen, and Helmut Miller, Niederrohrdorf, all of Switzerland, assignors to Escher Wyss Limited, Zurich, Switzerland

Filed Nov. 23, 1976, Ser. No. 744,253
Claims priority, application Switzerland, July 14, 1976, 9004/76; Dec. 2, 1975, 15610/75
Int. Cl.[2] F16C *32/06*
U.S. Cl. 308—9 **19 Claims**

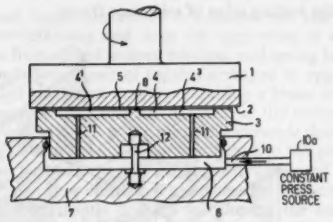
1. Hydrostatic apparatus for supporting a mobile part which moves relative to a foundation and has a bearing surface, the apparatus comprising

a. a bearing shoe mounted in the foundation and having a

bearing face directed toward said bearing surface which contains a bearing pocket;

b. a hydraulic servomotor having a pressure chamber and serving to urge the shoe toward the mobile part with a force which acts in opposition to a pressure force developed on said bearing face;

c. supply means for delivering hydraulic fluid under pressure to said pocket and pressure chamber; and



d. a support element connected with the shoe and the foundation and positively holding the shoe against movement in at least one direction along its supporting axis,

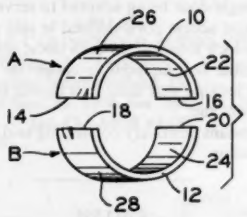
e. the restraint provided by the support element being so correlated with the relative magnitude of the pressure forces that the shoe is rendered non-displaceable in both directions along the supporting axis.

4,073,550

SLEEVE BEARING

William A. Yahraus, Mentor, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.

Filed May 26, 1976, Ser. No. 690,193
Int. Cl.² F16C *9/04*
U.S. Cl. 308—23 **13 Claims**



1. In a bearing of the type having a substantially cylindrical bearing area with inner and outer surfaces which surrounds a substantially cylindrical journaled member in a close spaced relationship therewith in a manner defining a clearance area between the inner surface of said bearing area and the outer peripheral surface of said journaled member adapted to receive a load supporting oil film, said bearing area being defined by a bearing material having a substantially constant radial thickness *t* throughout and wherein said bearing area has a substantially constant radius of curvature *r* at said inner surface with said journaled member having a substantially constant radius of curvature *rr* at the outer peripheral surface thereof slightly less than radius *r* and wherein said bearing is subjected to differential loading during cycling, the improvement comprising:

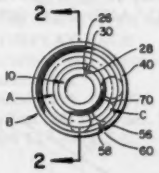
a first circumferential portion of said bearing area having a thickness slightly greater than *t* so as to reduce the radius of curvature of said inner surface to less than *r* but greater than *rr;* and, a second circumferential portion of said bearing area opposed from said first portion having a thickness slightly less than *t* so as to increase the radius of curvature of said inner surface to greater than *r.*

4,073,551

ROLLING TYPE BEARING AND METHOD FOR MAKING SAME

Walter S. Sutowski, Brecksville, Ohio, assignor to Freeway Corporation, Cleveland, Ohio

Filed July 8, 1976, Ser. No. 703,627
Int. Cl.² F16C *33/60*
U.S. Cl. 308—195 **23 Claims**



1. A bearing comprising in combination:

an inner race formed from a strip of sheet metal having spaced apart ends and formed through the plastic range into a first cylindrical configuration with said inner race ends closely spaced to each other and defining a first slot which allows said inner race ends to be selectively moved toward and away from each other, said inner race including at least one integrally formed outwardly opening roller member receiving groove circumferentially disposed in the outer peripheral surface thereof;

an outer race formed from a strip of sheet metal having spaced apart ends and formed through the plastic range into a second cylindrical configuration having a diameter greater than said inner race with said outer race ends closely spaced relative to each other and defining a second slot which allows said outer race ends to be selectively moved toward and away from each other, said outer race including at least one integrally formed inwardly opening rolling member receiving groove circumferentially disposed in the inner peripheral surface thereof; and,

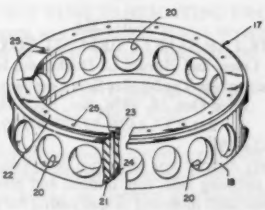
a plurality of rolling members disposed between said inner and outer races and closely received in said outwardly and inwardly opening grooves for allowing relative rotation between said races, said first and second slots allowing forced insertion of said rolling members between said races and into said grooves.

4,073,552

BEARING RETAINER

Ronald I. Christy, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 380,031, July 17, 1973, abandoned, which is a continuation of Ser. No. 259,891, June 5, 1972, abandoned. This application Mar. 24, 1975, Ser. No. 561,403
Int. Cl.² F16C *33/46*
U.S. Cl. 308—201 **26 Claims**



1. A ball bearing retainer including in combination, an inner annular body of open pore microporous flexible foamlike material, having sides generally perpendicular to the central axis of the annulus formed by the body and respective annular reinforcing plates of relatively rigid material secured to said sides,

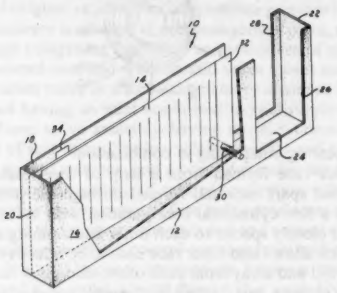
said foamlike material comprising an open pore microporous nitrile acrylic copolymer foam having a Shore A hardness of between 20 and 60.

4,073,553

MAG CARD STORAGE DEVICE

Raymond T. Cassidy, Ashfield, Mass., assignor to National Blank Book Company, Inc., Holyoke, Mass.

Filed May 17, 1976, Ser. No. 687,181
Int. Cl.[2] A47B *63/00*; G09F *11/06*
U.S. Cl. 312—184 **3 Claims**



1. Filing device for storing and viewing card holding envelopes comprising an upwardly opening tray having a bottom and fixed upright side and ends walls and defining a continuous compartment from end to end thereof; said envelopes having a width dimension generally on the order of the height of said walls; each envelope including an extension at the lower end thereof which is provided with an oblique slot opening toward a lower corner thereof said envelopes being adapted for opening to provide access for insertion and removal of material from each envelope when in its upright position; a fixed pivot pin disposed transversely of the tray at a distance from one end wall less than the width of said envelopes and defining with that end wall a viewing section and at a distance from the opposite end wall less than the overall length of said envelopes and defining with said opposite end wall a storage section, said pin also being spaced above said bottom sufficient to support the slotted lower corner portions of the envelopes above said bottom wall whereby with said slot fitted onto said pin, the envelopes are freely pivotable between horizontal and vertical positions from the storage to the viewing section with a side resting on the bottom of said tray in the horizontal position, and the lower edge thereof disposed on the bottom of said tray in said vertical position, the slot of each envelope being adapted to fit onto and be removed from said pin only at an oblique angular orientation intermediate said horizontal and vertical positions, said pin and said end walls serving to retain said envelopes within said tray at other than said oblique angular orientation.

4,073,554

MODULAR SAFETY DEPOSIT BOX SYSTEM

Charles D. Oder, and Harold G. Doehlman, both of Hamilton, Ohio, assignors to The Mosler Safe Company, Hamilton, Ohio

Filed Oct. 18, 1976, Ser. No. 733,053
Int. Cl.[2] A47B *53/00, 87/00*
U.S. Cl. 312—199 **11 Claims**

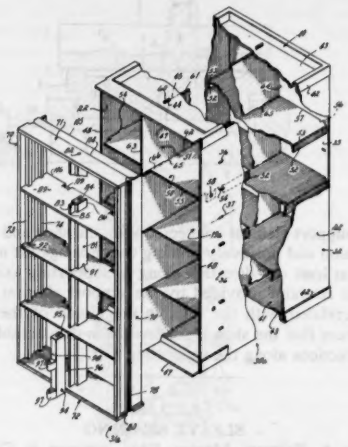
1. A safety deposit box structure comprising

a casing defining side, top, bottom and rear walls,

at least one shelf mounted in said casing for defining a plurality of box compartments within said casing,

a door frame for said casing, said door frame being comprised of a header, a sill and opposed jambs, said door frame components being structurally rigid, said door frame components being fixedly connected together into a structurally rigid frame configuration, and said door frame being sized to permit connection of said jambs with opposed side walls of said casing and to permit connection of said header and sill with said casing's top and bottom walls respectively,

at least one port plate positioned between jambs of said door frame, said port plate defining a number of access ports in said door frame equal in number to the number of box compartments defined in said casing, and each port plate cooperating with a shelf to extend said shelf to adjacent the leading edge of said door frame,



a hinge post fixedly connected to said door frame, and at least one strike plate defined in at least one jamb of said door frame,

a plurality of doors mounted in hinged relation on said hinge post, a single door being adapted to serve as a closure for each of said access ports defined in said door frame,

at least one lock mounted on each door, said lock including a retractable bolt adapted to cooperate with said strike plate for locking that door in a closed relation with said door frame, and

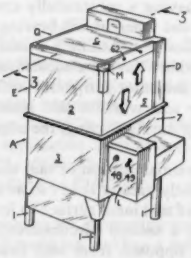
connector means positively connecting said rigid door frame to said casing.

4,073,555

DISHWASHER WITH DOWNWARDLY MOVABLE DOOR COUNTERBALANCED BY SPRING-BIASED TOGGLE JOINTS

Tore H. Noren, 3200 Lakeville Highway, Petaluma, Calif. 94952

Filed Dec. 22, 1975, Ser. No. 643,545
Int. Cl.[2] A47B *77/06, 51/00*
U.S. Cl. 312—229 **3 Claims**



1. A dishwashing machine comprising:

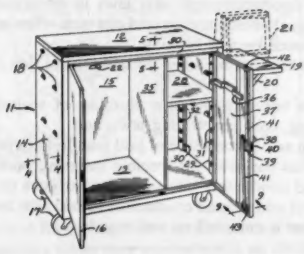
a. a tank for holding water for washing dishes;
b. a dish basket receiving compartment disposed above said tank;
c. a hood covering the top area of the compartment and supported by a back that also forms a wall of said tank;
d. a door movable vertically from a top position where it cooperates with said back and said hood for closing the compartment, to a bottom position where it is received in said tank and permits access into and out of the compartment;
e. spring biasd toggles connected to said door and said tank for counterbalancing said door for supporting it at all elevations from closed to open position, said spring biased toggles including a pair of toggles arranged at opposite sides of said tank, each toggle comprising a lower toggle arm having one end pivotally mounted at the bottom of said tank and adjacent to the vertically movable door, an upper toggle arm having one end attached to the pivotal connection between the two arms and its other end connected to an anchor collar that has means for adjusting its vertical and horizontal position for altering the tension and angle said spring makes relative to the pivotal connection between the two toggle arms;
f. said means for adjusting the vertical and horizontal position of said anchor collars includes an upright mounted in said tank for each anchor collar;
g. a sleeve adjustable vertically on each upright;
h. a threaded rod extending radially from each sleeve and supported thereby;
i. a tubular member for each threaded rod and having a threaded connection therewith;
j. a cross piece interconnecting the two tubular members and supporting said anchor collars; and
k. whereby said anchor collars can be moved into the correct position both vertically and horizontally by adjusting said sleeves on said uprights and adjusting said threaded rods for moving said tubular members so as to apply the proper tension and angle on said springs to substantially counterbalance the weight of said door.

4,073,556

RIGID MOBILE CABINET FOR AUDIO-VISUAL AIDS

Harry Howard Wilson, Jr., Park Forest, Ill., assignor to H. Wilson Corporation, South Holland, Ill.

Filed Sept. 21, 1976, Ser. No. 725,239
Int. Cl.[2] A47B *43/00*
U.S. Cl. 312—250 **10 Claims**



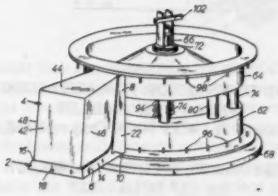
1. A mobile utility cabinet having an open front side, comprising a top wall, a back wall, a bottom wall, and spaced end walls, the latter having front and rear edges, a rigid frame connecting the lower portions of the end and back walls, said frame supporting the bottom wall, doors on the open front side of the cabinet, a top rail bridging the open front and connected at its ends to the end walls, said top rail supporting the front edge portion of said top wall, upstanding stringers one adjacent the front edge of each side wall, upstanding stringers one integral with each end of the back wall and disposed at right angles thereto to lie against the inside surface of the related side wall, all of said stringers being welded to the respective side walls, an inwardly turned flange on the rear edge of each side wall having surface contact with and being welded to the back side of the back wall, said flange and related stringer comprising a rigid post-like corner structure, and vertically spaced horizontally aligned shelf supporting means on each of said stringers.

4,073,557

DISPLAY CASE FOR USE WITH A MERCHANDISE DISPLAY RACK

Louis John Crosslen, Grafton, Wis., assignor to Frank Mayer & Associates, Inc., Grafton, Wis.

Division of Ser. No. 660,867, Feb. 24, 1976, Pat. No. 4,005,775.
This application Oct. 18, 1976, Ser. No. 733,105
Int. Cl.[2] A47F *5/02*
U.S. Cl. 312—284 **9 Claims**



1. In combination, a display case and a merchandise display rack for supporting said display case, said merchandise display rack including a pair of spaced apart support members, means for connecting said support members and whereby one of said support members is shiftable relative to the other support member for varying the distance therebetween, said display case including a base and a removable cover, said display case including a front side and a rear side narrower than said front side and a pair of converging lateral sides, said display case having a generally trapezoidal cross-sectional configuration in a plane transverse to the direction in which said support members are shiftable, said base including a bottom portion and a back portion, a hinge connected to said bottom portion and said back portion and hingedly connecting said portions for movement between an open position and an angular position, latch means on said portions for releasably securing said portions in said open position, said base including a pair of bores therein and said cover including a bore therein alignable with one of said pair of bores when said base and cover are together, said support members each having a projection receivable within said bores in said display case whereby said display case can be releasably mounted on and secured by said merchandise display rack in locked condition.

4,073,558

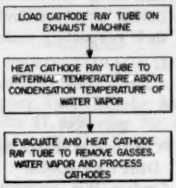
CATHODE RAY TUBE FABRICATING PROCESS

David Benda, Geneva, and Franklin G. Reigel, Waterloo, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Apr. 25, 1977, Ser. No. 790,499
Int. Cl.[2] H01J *9/385*
U.S. Cl. 316—18 **5 Claims**

1. A process for fabricating a cathode ray tube having an envelope with a funnel portion including a viewing screen and a neck portion including an electron gun assembly and said envelope having unwanted gases therein including water vapor, said process comprising the steps of:
loading said cathode ray tube onto a cathode ray tube exhaust machine which includes evacuating and heating apparatus;
activating said heating apparatus to provide a temperature

internal of said envelope in the range of about 40°–70° C; and subsequently


LOAD CATHODE RAY TUBE ON EXHAUST MACHINE
HEAT CATHODE RAY TUBE TO INTERNAL TEMPERATURE ABOVE CONDENSATION TEMPERATURE OF WATER VAPOR
EVACUATE AND HEAT CATHODE RAY TUBE TO REMOVE GASSES, WATER VAPOR AND PROCESS CATHODES

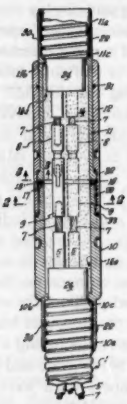
activating said evacuating apparatus to effect removal of said unwanted gases and water vapor from said envelope while said envelope is heated in said range.

4,073,559

ELECTRICAL CONNECTOR FOR SUBMERSIBLE OIL WELL PUMP CABLES

William H. Lawson, Jr., 4715 Webb Canyon Road, Claremont, Calif. 91711

Filed June 20, 1977, Ser. No. 808,327
Int. Cl.[2] H01R *13/52*
U.S. Cl. 339—94 R **8 Claims**



1. A disconnectable connector for electric power cable of the type having insulated conductors, a jacket, and metallic outer armor, comprising:

a first shell having a cable end receiving portion, external threads, and a generally annular end face portion;

a second shell having a cable end receiving portion and a generally annular end face portion;

a sleeve fitting over said second shell and having internal threads engageable with said external threads to draw said shells axially together and force said face portions together; and

a deformable sealing washer between said face portions,

said cable end receiving portions having internal dimensions to fit said armor and adapted to soldering said armor thereinto;

electrical connector pins on the ends of said conductors inside said shells, and

potting material inside said shells surrounding portions of said pins,

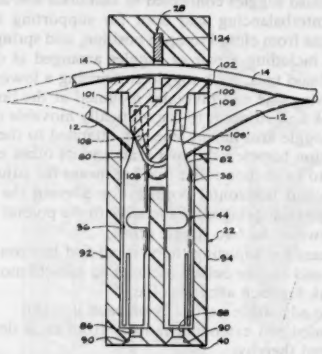
the outer diameters of said first shell and said sleeve being substantially the same to present a smooth outer contour.

4,073,560

ELECTRICAL CONNECTOR

John W. Anhalt, Orange; David S. Goodman, Mission Viejo, and Carl W. Peterson, Westminster, all of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 8, 1976, Ser. No. 664,488
Int. Cl.[2] H01R *13/38*
U.S. Cl. 339—99 R **12 Claims**



1. An electrical connector for an electrical cable having signal and ground conductors each having a metallic core covered with insulation comprising:

an elongated insulative housing;

said housing having a conductor receiving side and a mating side;

a row of spaced contact receiving cavities in said housing extending from said conductor receiving side to said mating side;

contacts mounted in said cavities, each said contact having a contacting section on said mating side and a termination section on said conductor receiving side;

said termination section of each said contact embodying insulation piercing, core penetrating jaws;

an insulative mandrel removably mounted on said conductor receiving side of said housing;

said mandrel having a first side facing said housing and a second side opposite to said first side, said first side embodying means for forcibly inserting portions of said signal conductors into said jaws to electrically connect said signal conductors to said contacts when said mandrel is mounted on said housing;

a ground buss bar mounted on said second side of said mandrel;

said buss bar embodying a plurality of spaced insulation piercing, core penetrating jaws; and

means on said second side of said mandrel cooperating with said buss bar jaws for forcibly inserting portions of said ground conductors into said buss bar jaws to electrically connect said ground conductors to said buss bar when said buss bar is mounted on said mandrel.

4,073,561

METHOD FOR FORMING A HEAT SINK AND CONNECTOR DEVICE AND THE PRODUCT THEREOF

Conrad J. Baranowski, 27 Elmore St., Arlington Heights, Mass. 02174

Filed Nov. 18, 1976, Ser. No. 743,153
Int. Cl.[2] H01R *13/00*
U.S. Cl. 339—112 R **4 Claims**

1. A heat sink arrangement comprising:

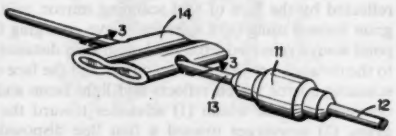
a substantially straight length of electrical lead material;

a hollow thermally-conductive member having a single wall of uniform thickness forming an elongated figure eight

cross section and having a pair of holes through opposite ends thereof in alignment with the direction of elongation of said figure eight cross section;

said length of electrical lead material extending through said pair of holes with edges of said holes biting into opposing sides of said length of electrical lead material;

the portions of said hollow member which form the central



section of said figure eight cross section pressing against said length of electrical lead material from opposite sides thereof; and

said thickness of said wall of said hollow member being approximately two times the thickness of said electrical lead material, and the mass of said hollow member being large compared with the mass of said length of electrical lead material enclosed within said hollow member.

4,073,562

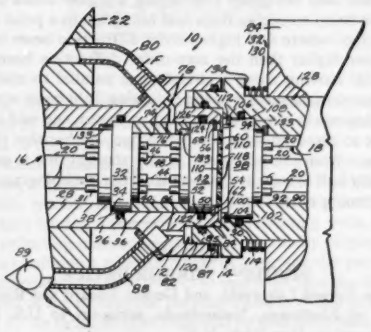
WET CONNECTOR

Neil Karlskind, Chatsworth, Calif., assignor to Gray Tool Company, Houston, Tex.

Filed Aug. 30, 1976, Ser. No. 718,473

Int. Cl.² H01R *13/52, 13/54*

U.S. Cl. 339—117 P **13 Claims**



1. A method for mating two complementary insulated electrical connectors while they are bathed in an electrically conductive medium such as sea water, comprising:

bringing the two connectors into mechanical contact, with their respective matable electrical parts presented in axial alignment across a sealed chamber that is defined between said parts as mechanical contact is accomplished;

pumping an electrically non-conductive fluid under pressure through the chamber to flush electrically conductive medium and any debris therefrom; and

applying an axial force to the matable electrical part of one connector to force that part axially across the chamber and into mating relation with the matable electrical part of the other connector.

4,073,563

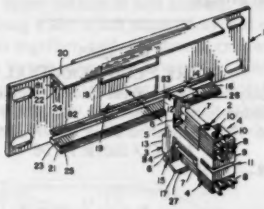
STRUCTURE FOR ELECTRICAL CONNECTIONS AND PANEL ASSEMBLY

James R. Bailey, Chicago, and Vernon W. Lavigne, Rolling Meadows, both of Ill., assignors to Switchcraft, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 520,927, Nov. 5, 1974, abandoned. This application Apr. 15, 1976, Ser. No. 677,223

Int. Cl.² H01R *9/16*; H02B *1/02*

U.S. Cl. 339—128 **13 Claims**



1. A modular jack frame structure for electrical connections adapted to be secured in an opening in a panel comprising a molded rigid frame formed from an electrically insulating material, said frame having a forward rectangular portion of substantial thickness, said forward portion having a front face, a rear face, a top and a bottom with one or more holes therein extending from the front face to the rear face and a rearward portion carrying one or more electrical contact assemblies adapted to be electrically connected to electrically conducting means inserted into said holes, the front face of said forward portion being adapted to fit into an opening in a panel, first slots open outwardly and extending transversely from side to side within the top and within the bottom of said forward portion to receive means for fastening said jack frame in an opening in a panel, second slots open outwardly and extending perpendicularly to said first slots from front to rear within the top and within the bottom of said forward portion to receive alternate means for fastening said jack frame in an opening in a panel, and means engaging one or more of said slots to secure said modular jack frame in an opening in a panel.

4,073,564

CHRISTMAS TREE SERIES LIGHT STRING

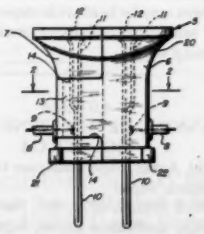
George B. Davis, Jr., 7512 Marbury Road, Bethesda, Md. 20034

Continuation-in-part of Ser. No. 751,089, Dec. 16, 1976. This application Feb. 11, 1977, Ser. No. 767,881

The portion of the term of this patent subsequent to Feb. 1, 1994, has been disclaimed.

Int. Cl.² H01R *11/02*

U.S. Cl. 339—157 C **5 Claims**



1. A two prong electrical connector for connecting electrical apparatus to a two conductor electrical outlet comprising, on insulating housing of two seperatable halves, a terminal prong mounted in and extending respectively from each half of said housing and to which may be electrically connected said apparatus and with the longitudinal axis of said terminal prongs positioned substantially parellel with each other when said

connector halves are secured together, means forming at least one pair of arms extending form one half of said housing, arm receiving surfaces formed in the other half of said housing and with said arms and arm receiving surfaces positioned to engage and releasably secure said connector halves together by movement of said connector halves together in a direction substantially transverse to the longitudinal axis of said terminal prongs and to prevent seperation of said connector halves except by movement of said connector halves apart along a plane lying substantially transverse to the longitudinal axis of said terminal prongs.

4,073,565

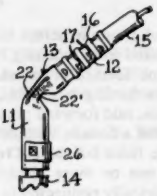
SPARK PLUG TERMINAL

Eugene B. Raymond, 4041 West Grove, Skokie, Ill. 60076

Continuation-in-part of Ser. No. 650,889, Jan. 21, 1976, abandoned. This application June 2, 1977, Ser. No. 802,821

Int. Cl.[2] H01R *11/08*

U.S. Cl. 339—223 S **3 Claims**



1. A spark plug terminal formed from a single sheet of material comprising

a. an elongated body providing at one end a spark plug receiving member and at the opposite end a conductor receiving member,

b. said body having portions of its opposite longitudinal side edges notched to provide a U-shaped medial section,

c. elongated slots formed in said U-shaped medial section, with said slots being equally spaced from each other and from said notched side edges of said body so as to provide a plurality of collapsible strips extending between said spark plug receiving member and said conductor receiving member,

d. each of said strips terminating at its outermost ends into a tapered wall whereby the medial portion of each of said strips lies in a plane different from that of said sparkplug receiving member and said conductor receiving member,

e. said slots being of a length to extend into said tapered walls so as to provide a bendable junction between said outermost ends of said strips and said spark plug receiving member and said conductor receiving member, whereby said members may be bent with respect to each other, with certain of said strips collapsing inwardly with respect to the remaining strips.

4,073,566

BEAM SCANNING DEVICE USING A STATIONARY HOLOGRAM

Masaru Noguchi, Asaka, Japan, assignor to Fuji Photo Film Co., Minami-ashigara, Japan

Filed Sept. 4, 1975, Ser. No. 610,179

Claims priority, application Japan, Sept. 4, 1974, 49-101486

Int. Cl.[2] G02B *5/32;* G03H *1/22*

U.S. Cl. 350—3.71 **6 Claims**

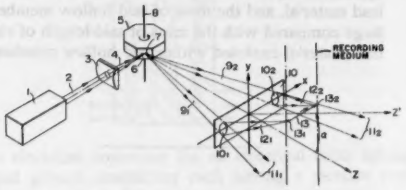
1. A light beam scanning device for scanning a surface with a monochromatic light beam for indicating information thereon comprising in combination:

a light source which generates a collimated monochromatic light beam,

a scanning mirror which is rotatable or swingable about an axis and located in the optical path of said light beam for reflecting and deflecting a diverging light beam,

a converging optical element having one-directional focusing power and located between the light source and the scanning mirror for focusing the light beam generated from the light source only in the direction of said axis and forming a line image on the face of said mirror,

a hologram located between the scanning mirror and said surface in the optical path of the diverging light beam reflected by the face of said scanning mirror, said hologram formed using (a) a spherical wave emerging from a point source removed from the hologram a distance equal to the distance between said hologram and the face of said scanning mirror which reflects said light beam and (b) a converging beam which (1) advances toward the hologram, (2) converges toward a first line disposed on a farther side of said hologram opposite from the side at which the source of said converging beam is disposed, said first line being removed from said hologram a distance which is half of the distance between the reflecting face of



the scanning mirror and the hologram and being oriented perpendicular to said axis and to the direction of general advancement of said converging beam, and (3) converges along a second line disposed on said farther side of said hologram and being removed from said hologram a distance which is equal to the distance between the reflecting face of the scanning mirror and the hologram and being oriented in the direction of said axis and perpendicular to the direction of general advancement of said converging beam, said hologram converging a higher order diffraction beam emerging from said hologram to a point at said surface where said higher order diffraction beam is of an order higher than the zero-order diffraction beam, said point moving along a straight line parallel to said hologram on said surface as the diverging light beam scans the hologram in one direction, said hologram and said surface are so disposed with respect to one another that the distance from the hologram to said straight line is substantially half as long as the distance from the hologram to the scanning mirror face.

4,073,567

PIVOTING MIRROR DEVICE

Herman Gerard Lakerveld, and Gerard Eduard van Rosmalen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 8, 1975, Ser. No. 638,510

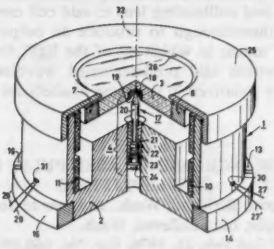
Claims priority, application Netherlands, Sept. 29, 1975, 7511417

Int. Cl.[2] G02B *27/17*

U.S. Cl. 350—6.5 **6 Claims**

1. A pivoting mirror device for directing a light beam in a video disk player comprising a frame, an elongated pivotal bearing extending from the frame, a mirror centrally supported on said bearing for pivotal motion, said mirror having a reflective surface on a side opposite said bearing, at least one permanent magnet near the edge of said mirror and being radially polarized with respect to said pivot, said permanent magnet on said mirror providing local magnetic field lines extending substantially parallel to the reflecting surface of said mirror, and an electro-dynamic drive means in the path of said mag-

netic field lines for pivoting said mirror about said bearing under the influence of an electric control signal and comprising



at least one control coil of wire, substantially all of the wire in said control coil extending substantially parallel to the mirror surface.

4,073,568

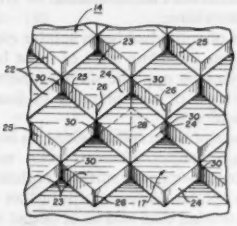
RETROREFLECTOR UNITS WITH THREE MUTUALLY PERPENDICULAR SURFACES DEFINING A TRIHEDRAL ANGLE OF A RECTANGULAR PARALLELEPIPED

James H. Heasley, Shaker Heights, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

Filed Nov. 26, 1975, Ser. No. 635,634

Int. Cl.² G02B *5/124*

U.S. Cl. 350—103 **19 Claims**



1. A retroreflector comprising a light-transmitting sheet adapted in use to be disposed in an angled position such that a normal to the sheet is at an angle of about 5° to about 85° from an incident beam of light, said sheet having front and back, opposed, substantially parallel faces, the front face being substantially smooth and defining a light-refracting surface, the back face having a plurality of light-reflecting units, at least some reflecting units comprising three mutually perpendicular surfaces defining a trihedral angle of a rectangular parallelepiped and positioned with respect to said front face that the body diagonal of the rectangular parallelepiped is within an angle of about 15° to incident light refracted by said front face, at least two of said three mutually perpendicular surfaces being rectangular and said two surfaces being vertically disposed.

4,073,569

PRISMATIC STEREOSCOPIC VIEWER

John Rizzo, 1546 W. 11th St., Brooklyn, N.Y. 11204

Filed Mar. 25, 1976, Ser. No. 670,374

Int. Cl.² G02B *27/22*

U.S. Cl. 350—137 **1 Claim**

1. A prismatic stereoscopic viewer comprising, in combination,

a housing having separate upper and lower sections and containing a recess in a front portion of said housing,

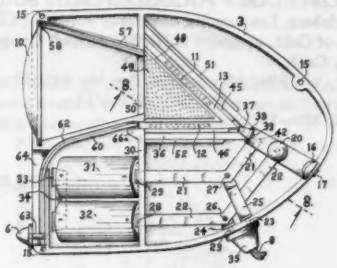
a magnifying lens mounted in said recess,

a prism mounted in said casing behind said lens, said housing containing a V shaped slot in said upper section adjacent to said prism,

a V shaped slide mount removably inserted into said V shaped slot, said housing forming V shaped pairs of ridges adjacent to said V shaped slot,

an acutely bent V shaped diffusion glass supported by said V shaped pairs of ridges inside the housing adjacent to said V shaped slot,

an electrically conductive clip of spring material fixed to said lower section of said housing and extending upward within said upper section of said housing, said upper section containing a slip notch engaged by said clip holding said sections together, said clip having an inward extending portion terminating in an inverted U shaped bend of said clip, said U shaped bend having a vertical arm fixed to said V shaped difusion glass and a switch extending within said V shaped diffusion glass below said V shaped slot,



a light bulb mounted in said housing beyond said diffusion glass on said inward extension of said clip,

battery means within said housing,

an electrical contact,

electrical connectors connecting said contact and said bulb to said battery means so that insertion of said V shaped slide mount moves said switch against said contact lighting said bulb, said housing containing a lateral slot adjacent to said lens,

a black flexible curtain slidably mounted within said casing, and

a sliding nob attached through said lateral slot to said curtain so that said curtain may be slid by said nob into contact with said switch moving said switch against said contact and lighting said bulb while said curtain underlies one side of said V shaped slot for the viewing of conventional slides inserted in the other side of said V shaped slot.

4,073,570

ELECTROCHROMIC DISPLAY DEVICE

Karel Anthony Korinek, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 15, 1976, Ser. No. 667,216

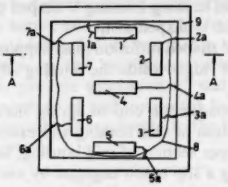
Claims priority, application United Kingdom, Mar. 13, 1975, 10454/75

Int. Cl.² G02F *1/36*

U.S. Cl. 350—357 **10 Claims**

1. An electrochromic device comprising a working electrode having radiation reflection or transmission properties, a counter electrode, and an electrochromic medium contacting

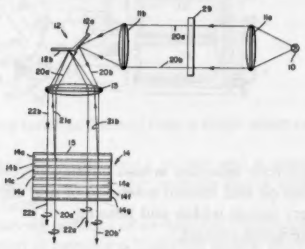
the working and counter electrodes, the medium comprising an electrochromically active material, an auxiliary redox system present in a concentration from 1×10^{-5} to 5×10^{-2} M and an inert electrolyte.



4,073,571
CIRCULARLY POLARIZED LIGHT SOURCE

Jan Grinberg, Los Angeles, and Leroy J. Miller, Canoga Park, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 5, 1976, Ser. No. 683,557
Int. Cl.[2] G02F *1/13*
U.S. Cl. 350—337 **7 Claims**



1. A circularly polarized light source comprising:

a. at least one circularly polarizing cholesteric liquid crystal cell means, said means reflecting a first portion of unpolarized light incident thereon in one circular polarization handedness sense and transmitting a second portion of said light in the other circular polarization handedness sense within a predetermined wavelength bandwidth around a predetermined central wavelength, the polarization of the light outside said bandwidth being unaffected by the cell and said light being transmitted through said cell unpolarized;

b. mirror means having an acute angle between at least two intersecting tangent lines which are respectively tangent to at least first and second portions of the surface of said mirror means for receiving and reflecting light and for producing a change from one circular polarization handedness sense to the other when circularly polarized light is reflected from said mirror means;

c. a source of unpolarized light;

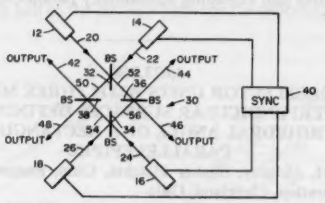
d. means to focus light from said source onto a first of said portions of said mirror means, said mirror means being positioned relative to said light source and said liquid crystal cell means so that said focused light is reflected from swaid first portion of said mirror means to said cell means;

e. collimating lens means positioned between said mirror means and said cell means to collimate said light reflected from said mirror means towards said cell means; the plane of the entrance window of said cell means being positioned at an acute angle with respect to the direction of propagation of said collimated reflected light such that the handedness sense portion of said collimated light which is reflected by said cell means returns through said collimating lens to a second of said portions of said mirror means and after reversal of the sense of circular polarization handedness at said mirror means is again reflected back through said collimating lens to said cell means for transmission therethrough to produce an output beam from said cell means in which all of the light from said light source within said predetermined wavelength band is circularly polarized in the same handedness sense.

4,073,572
SYSTEM FOR INCREASING LASER PULSE RATE WITH BEAM SPLITTERS

Kenneth Avicola, Richland, Wash., assignor to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed Feb. 23, 1976, Ser. No. 660,650
Int. Cl.[2] G02B *27/14;* B01D *59/44*
U.S. Cl. 350—174 **13 Claims**



1. For use in a system for combining a plurality of beams of laser radiation of different characteristics, an array of beam splitter elements comprising:

a plurality of sets of individual beam splitter elements;

said plurality of sets including a set of input beam splitter elements receiving on opposite surfaces thereof the laser radiation from two of said plurality of laser beams of different characteristics;

said plurality of sets of beam splitter elements including a set of output beam splitter elements with each element thereof receiving on opposite surfaces radiation from two different beam splitter elements of a further set of beam splitter elements other than said set of output beam splitter elements and operative to transmit and reflect a portion of each incident beam to provide two of said plurality of output beams, each beam containing radiation components of all of the input beams of pulsed laser radiation applied to said system; and

a plurality of mirrors for directing radiation from one set of elements diverging from said array to elements of a further set of beam splitter elements.

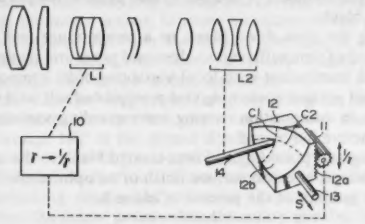
4,073,573
ZOOM LENS SYSTEM

Akira Yamagishi, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Nov. 29, 1976, Ser. No. 745,606
Claims priority, application Japan, Nov. 27, 1975, 50-142119
Int. Cl.[2] G02B *15/18*
U.S. Cl. 350—187 **5 Claims**

1. A zoom lens system comprising a zooming movable lens group (L1, L11) and a focusing lens group (L2, L12) wherein the focusing lens group (L2, L12) is axially moved to maintain the resultant image position in a stationary image plane when the zooming movable lens group (L1, L11) is axially moved for varying the focal length thereof, wherein the improvement comprising conversion means (10, P1, 20) for converting the distance of axial movement of the zooming movable lens group (L1, L11) to a value representing a reciprocal number of the afocal magnification ($1/\gamma$) of the zoom lens system, calculating means (11, 12, 13; 21) which receives said value (γ) and a signal representing the distance (S) of an object to be photographed

from the zoom lens system and gives an output representing a distance (Δx) by which the focusing lens group (L2, L12) should be axially moved to maintain the resultant image position in a stationary image plane, and connecting means (14; 22,



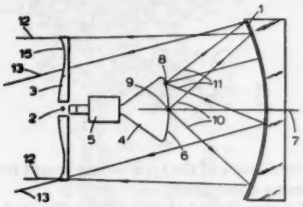
M, P2) for connecting said calculating means (11, 12, 13; 21) with said focusing lens group (L2, L12) to move the focusing lens group (L2, L12) in accordance with the output (Δx) from said calculating means (11, 12, 13; 21).

4,073,574

OPTICAL PROJECTOR

John Alfred Clarke, Wallington, and Harry Howden, Smallfield, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 525,664, Nov. 20, 1974, abandoned. This application Oct. 1, 1976, Ser. No. 728,508
Claims priority, application United Kingdom, Nov. 28, 1973, 55177/73
Int. Cl.² G02B 3/04, 17/08
U.S. Cl. 350—189 7 Claims



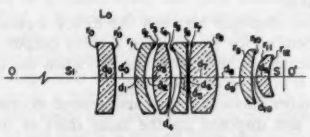
1. An optical system comprising an image forming system and a symmetrical aspheric element placed proximate a principal plane of the image forming system, the thickness of the aspheric element having an aspheric polynomial function including a term proportional to the third power of the distance from the optic axis.

4,073,575

OBJECTIVE FOR VIDEO DISKS

Toshimichi Koizumi, Sagamihara, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 12, 1976, Ser. No. 685,675
Claims priority, application Japan, May 15, 1975, 50-57798
Int. Cl.² G02B 11/32, 11/34
U.S. Cl. 350—214 4 Claims



1. An objective for video disks comprising a front lens group and rear lens group, said front lens group comprising a first, second, third and fourth lens components, said rear lens group comprising a fifth and sixth lens components, said first lens component being a negative meniscus lens, said second lens component being a biconvex lens, said third lens component being a negative lens, said fourth lens component being a positive lens, said fifth lens component being a positive meniscus lens, said sixth lens component being a positive meniscus lens, said objective for video disks satisfying the following conditions:

$$0.52 \geqq d8/f \geqq 0.42 \quad (1)$$
$$0.97 \geqq f_R/f \geqq 0.93 \quad (2)$$
$$3.5 \geqq f_F/f_R \geqq 3.3 \quad (3)$$

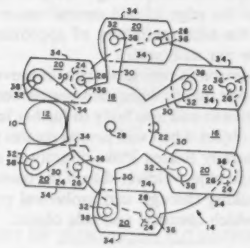
wherein reference symbol f represents the focal length of the lens system as a whole, reference symbol f_F represents the total focal length of the front lens group, reference symbol f_R represents the focal length of the rear lens group, and reference symbol d_8 represents the airspace between the front and rear lens groups.

4,073,576

DEVICE FOR CHOPPING AN OPTICAL BEAM

Robert Edward Bastian, Wyckoff, N.J., assignor to North American Philips Corporation, New York, N.Y.

Filed Aug. 30, 1976, Ser. No. 718,869
Int. Cl.² G05D 25/00
U.S. Cl. 350—273 7 Claims



1. A device for chopping an optical beam comprising at least one chopper blade having parallel edges, and means for moving said blade through said beam so that said edges always remain parallel to themselves through said beam, said blade moving means comprising a rotatably mounted primary disc, a secondary disc eccentrically rotatably mounted with respect to said primary disc and having at least one radially extending spoke extending therefrom, said chopper blade being rotatably mounted on both of said primary disc and said spoke.

4,073,577

CONTACT LENSES OF HYDROPHILIC POLYMERS MADE BY PHOTOPOLYMERIZATION

Peter Höfer, Aschaffenburg, Germany, assignor to Titmus Eurocon Kontaktlinsen KG, Aschaffenburg, Germany

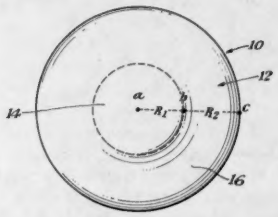
Continuation of Ser. No. 604,516, Aug. 13, 1975, abandoned, which is a continuation of Ser. No. 442,719, Feb. 14, 1974, abandoned. This application Oct. 22, 1976, Ser. No. 735,227
Claims priority, application Germany, Feb. 19, 1973, 2308047
Int. Cl.² G02C 7/04
U.S. Cl. 351—160 11 Claims

1. Contact lens consisting essentially of a hydrogel of a polymer of a single monomer selected from the group consisting of a hydoxyalkyl acrylate and a hydroxyalkyl methacrylate, said single monomer being photopolymerized in the absence of a cross-linking agent.

4,073,578
SPECTACLE LENS FOR APHAKIA PATIENTS

Robert C. Welsh, Coconut Grove, Fla., assignor to Phillip M. Frieder, Miami, Fla., a part interest

Filed Apr. 21, 1975, Ser. No. 570,218
Int. Cl.[2] G02C 7/02; G02B 3/04
U.S. Cl. 351—167 9 Claims



1. An aspheric cataract spectacle lens for improving the peripheral vision of a person suffering from aphakia by forcing head movement for central viewing of side objects, the improvement comprising:

a lens body, said body having an anterior surface and an interior surface,

said anterior surface having a central spherically curved area and a peripheral aspheric curved area,

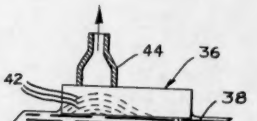
said aspheric curved area having a diopter rate of change beginning at the edge of said central vision area and extending to the body periphery of approximately a one-third diopter per millimeter,

whereby the person is provided with improved peripheral vision of a side object when said person centrally fixates his eye relative to said lens body to further improve vision of said side object when said person rotates his head with his eyes centrally fixated looks directly at said object to make said side object clearer than if the person rotated his eye thus looking through said aspherical portion of said lens body which obscures said side object.

4,073,579
OPHTHALMIC LENS WITH LOCALLY VARIABLE INDEX OF REFRACTION AND METHOD OF MAKING SAME

Emil W. Deeg, Woodstock, Conn., and David A. Krohn, Southbridge, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed June 9, 1976, Ser. No. 694,428
Int. Cl.[2] G02B 27/10; C03C 15/00, 17/00, 19/00
U.S. Cl. 351—169 8 Claims



1. The method of making an ophthalmic lens having locally variable index of refraction comprising the steps of:

shaping a piece of microporous glass to the configuration desired of a blank from which said lens may be formed, said blank being greater in size than desired of said lens;

placing a side of said blank in contact with a solution of an inorganic salt to cause at least partial filling of a preselected portion of said blank with said solution by capillary forces of open pores of said glass;

removing said blank from said salt solution and causing evaporation of the solvent of said solution from said pores and precipitation of said salt in said preselected portion of said blank;

heating the thus dried blank to a temperature and for a period of time sufficient to close said pores and render said blank transparent with local variations of its composition in said portion containing said precipitated salt, said variations in composition causing corresponding variations in refractive index, and

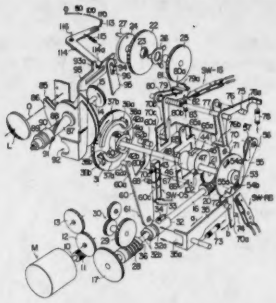
grinding and polishing said heat-treated blank to the meniscus shape, size and surface finish of an ophthalmic lens.

8. The product of the process of claim 1.

4,073,580
FADE PHOTOGRAPHING CONTROL APPARATUS FOR CINE CAMERA

Toshitatsu Kawatsu, Shimosuwa, Japan, assignor to Sankyo Kogaku Kogyo Kabushiki Kaisha, Japan

Filed June 23, 1976, Ser. No. 698,913
Int. Cl.[2] G03B 21/36
U.S. Cl. 352—91 C 11 Claims



1. In a cine camera of the type having means for adjusting a shutter opening comprising:

a pair of sector-shaped shutter blades disposed for rotation into overlapping relationship on an optical axis passing through said shutter opening;

wherein the improvement comprises:

means for fade photographing comprising:

an operating member for initiating a fade photographing operation and rockable between a first and a second position;

detent means for locking the operating member in the second position;

a rotary member capable of rotation in a first direction and in an opposite, second direction;

a motor means for operating in a forward and reverse direction;

energizing means for operating said motor means comprising a cut-off switch and a reverse rotation switch;

means connected to said motor means for driving one of said pair of shutter blades and for driving a film past said optical axis;

clutch means disposed between the motor means and the rotary member for transmitting a drive output from the motor means to the rotary member when the operating member is in its second position;

a cam member including first and second eccentric cam surfaces and disposed on the same shaft as the rotary member for integral rotation with the rotary member only when the rotary member rotates in the first direction;

fade out stop means operable in following relationship with the first eccentric cam surface when the rotary member

rotates in the first direction for turning off said cut-off switch and deenergizing the motor means when the rotary member has rotated through 180°;

an operating button means capable of being operated externally of the camera for closing said reverse rotation switch for the motor means, to cause a rotation of the motor in the reverse direction for feeding the film in a reverse direction during the time the rotary member rotates through **180°** in the second direction;

reverse film feed stop means for interrupting the rotation of the motor means when the rotary member has rotated through 180° in the second direction;

means for unlocking said operating means;

a third cam surface on the cam member for operating said unlocking means and releasing the operating member from the detent means when the rotary member has again rotated through 180° in the first direction, thereby interrupting the rotation of the rotary member;

shutter opening control means for operating the other of said pair of shutter blades; and

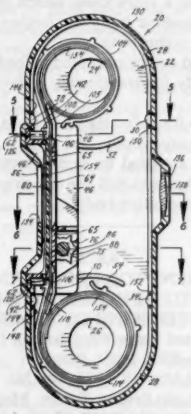
means connecting the second cam surface and the shutter opening control means for varying the shutter opening in a decreasing direction during the initial rotation of the rotary member through 180° in the first direction, and for varying the shutter opening in an increasing direction during the final rotation of the rotary member through 180° in the first direction.

4,073,581

VIEWER FOR A STRIP OF FILM

Herbert F. Rayburn, 3rd & Oak, Box 11, Kimmswick, Mo. 63053

Filed June 9, 1976, Ser. No. 694,189
Int. Cl.² G03B *21/00*
U.S. Cl. 352—129 **20 Claims**



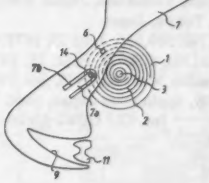
1. A viewer for a strip of film which comprises an open-type support that has a space adjacent one end thereof to accommodate a rolled-up strip of film and that has a second space adjacent the opposite end thereof to accommodate said rolled-up strip of film, a resilient film guide disposed adjacent the first said space to accommodate and help confine said rolled-up strip of film, a movement-limiting surface adjacent said resilient film guide which can receive, and limit movement of, one edge of said rolled-up strip of film as said rolled-up strip of film is moved edge-wise into position to be confined by said resilient film guide, a light-diffusing element which is intermediate said first said space and said second space, a member which is adjacent to but which is spaced from said light-diffusing element to define a passage for said strip of film, a film-moving element which can move said strip of film through said passage, and a walled cover which is selectively engageable with or separable from said support, said resilient film guide having spaced-apart portions which permit direct access to the outermost turn of said rolled-up strip of film to permit a use of said viewer to contact, and apply circumferentially-directed forces to, said outermost turn to facilitate the advancing of the leading edge of said outermost turn into and through said passage and into said second space, said resilient film guide and said light-diffusing element and said member and said film-moving element being adapted to guide and confine said strip of film wholly independently of said walled cover, whereby said strip of film can be secured to and confined and held by said support while said walled cover is remote from, and hence permits full and free access to, said support, said walled cover coacting with said support whenever said walled cover is in engagement with said support to completely enclose said resilient film guide and said member and said strip of film.

4,073,582

CAMERA SHUTTER

Peter Lermann, Feldkirchen, Germany, assignor to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Mar. 16, 1977, Ser. No. 778,138
Claims priority, application Germany, Mar. 18, 1976, 2611351
Int. Cl.² G03B *19/18*
U.S. Cl. 352—141 **10 Claims**



1. In a shutter for photographic and cinematographic cameras, a combination comprising at least one diaphragm leaf; pivot means mounting said diaphragm leaf angularly displaceable about a pivot axis; a cam element having an arcuate cam track; a prime mover connected with said cam element for rotating the same; and a cam follower tracking said cam track and engaging said diaphragm leaf at a location which is laterally offset from said pivot axis, so that rotation of said cam element results in angular displacement of said diaphragm leaf about said pivot axis.

4,073,583

PHOTOELECTROPHORETIC HEAT AND PRESSURE TRANSFER MECHANISM

Roger G. Teumer, Fairport; Peter J. Warter, Jr., Penfield; Gino F. Squassoni, Pittsford; Vseevolod Tulagin, Rochester, and Raymond K. Egnaczak, East Williamson, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 24, 1975, Ser. No. 571,170
Int. Cl.² G03G *17/04*
U.S. Cl. 355—3 P **3 Claims**

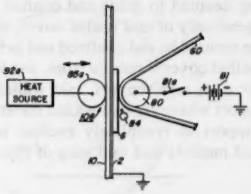
1. A transfer assembly for transfer and fixation of photoelectrophoretic image containing pigment particles and insulating carrier fluid from a flexible charge-conductive belt or web to a transfer sheet, belt, or web containing thermoplastic material comprising:

means for inking and image-wise exposing the charge conductive belt or web in temporary conjunction with a blocking electrode in an electric field to obtain at least one photoelectrophoretic image; and

means for advancing and guiding the flexible charge con-

ductive belt or web and formed image through an image transfer zone having,

heating means in temporary biased movable contact with the non-imaging side of the advancing flexible charge-conductive belt or web, a guide or roll for guiding the transfer sheet, belt or web into temporary contact with



at least part of the biased charge conductive belt and image within the image transfer zone along a line about opposite the biased heating means; and

means for diluting the atmosphere to vary the dielectric properties thereof at one or more nips between the charge-conductive belt or web and the transfer sheet, belt or web.

4,073,584

SLIT EXPOSURE DEVICE FOR USE WITH A STATIONARY ORIGINAL CARRIAGE

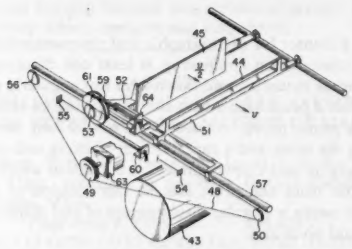
Tadayuki Kitajima, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 589,086, June 23, 1975, abandoned, which is a division of Ser. No. 509,077, Sept. 25, 1974, abandoned. This application Mar. 10, 1976, Ser. No. 665,393

Claims priority, application Japan, Sept. 27, 1973, 48-108676

Int. Cl.[2] G03G *15/28*

U.S. Cl. 355—8 **3 Claims**



1. An electrophotographic apparatus comprising:

a stationary original carriage for carrying an original thereon;

a first mirror means for reflecting image light of the original, said first mirror means being movable in parallel with said original carriage;

a light source for illuminating the original, said light source being integral with said first mirror means;

a second mirror means for receiving the image light which has been reflected by said first mirror means, said second mirror means being movable in the same direction as that of said first mirror means and at a speed which is one half the speed of movement of said first mirror means to direct the image light to a predetermined position;

projection lens means for focussing the image light which has been reflected by said second mirror means onto a photosensitive member to form an image of the original on a surface of the photosensitive member;

a rotatable pulley movable together with said second mirror means;

a mirror transport wire engaged with said pulley;

driving means for moving said transport wire to move said second mirror means at said half speed and for rotating said pulley; and

an electric wire having one end connected to said light source fixed on said first mirror means, said electric wire travelling around said rotatable pulley for coupling to a power source in such a manner that said electric wire is not damaged due to movement of said light source.

4,073,585

SHEET REMOVING DEVICE FOR USE IN ELECTROPHOTOGRAPHIC COPYING MACHINE

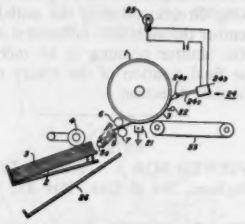
Tatsuo Kobayashi, Machida, and Akira Miyazaki, Isehara, both of Japan, assignors to Rank Xerox Ltd., London, England

Filed July 27, 1976, Ser. No. 709,156

Claims priority, application Japan, Sept. 26, 1975, 50-115656

Int. Cl.[2] G03G *15/04;* B65H *7/06*

U.S. Cl. 355—14 **3 Claims**



1. In an electrophotographic copying machine wherein a developed latent image is produced on a photosensitive body and transferred to a copy sheet which is thereafter stripped from the photosensitive body for further processing, a sheet removing device comprising:

a reversible feed roll pair adapted to feed sheets to the photosensitive body for transferring a developed latent image thereto;

detector means for detecting a failure in stripping a sheet off the photosensitive body, and

control means actuated by said detector means to reverse said feed roll pair to pull the mis-stripped sheet backward off the photosensitive body.

4,073,586

ARRANGEMENT FOR PROJECTING IMAGES OF MARKERS ON TO A PHOTOSENSITIVE SURFACE IN A TELECINE EQUIPMENT

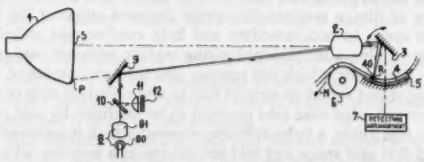
Michel Favreau, and Serge Vidal, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 18, 1976, Ser. No. 687,630

Claims priority, application France, May 23, 1975, 75 16066

Int. Cl.[2] G03B *27/76, 27/78*

U.S. Cl. 355—20 **3 Claims**



1. In a telecine equipment comprising a flying spot cathode-ray tube, an objective lens, and an oscillatory mirror for scanning films comprising frames and markers associated in a one to one relationship with said frames, an arrangement for pro-

jecting on to a photosensitive surface an image of the marker associated with the frame being scanned, said arrangement comprising first means for illuminating the marker associated with the frame being scanned, and second means for forming on said photosensitive surface an image of the illuminated marker, said first means comprising a fixed light source, and an optical channel, including said objective lens and said oscillatory mirror, for forming an image of said fixed light source on the marker associated with the frame being scanned.

4,073,587

COROTRON APPARATUS

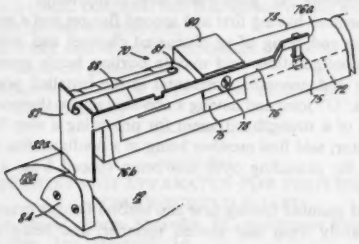
Michael Frederick James Selwyn, Lydney, England, assignor to Rank Xerox Ltd., London, England

Filed Mar. 26, 1976, Ser. No. 671,225

Claims priority, application United Kingdom, Oct. 24, 1975, 43919/75

Int. Cl.² G03G *15/00*

U.S. Cl. 355—3 CH **10 Claims**



1. An apparatus for preventing contamination of a corotron electrode in an electrostatographic copying machine comprising a support means to which the opposite ends of said corotron wire are affixed to hold said wire at a predetermined tension, vibration means positioned adjacent said corotron wire operable to vibrate said wire a predetermined amplitude to prevent the accumulation of contaminants thereon, and means for activating said vibration means periodically in response to the movement of a rotating portion of said electrostatographic machine, said vibration means including a pick means connected to a shaft generally parallel to said corotron wire, said shaft having a follower surface connected thereto, said follower surface being positioned to be struck and oscillated by a striker plate connected to a rotating portion of said electrostatographic machine.

4,073,588

APPARATUS FOR APPLYING INDICIA TO FILMS AND ENVELOPES IN PHOTOGRAPHIC PROCESSING LABORATORIES

Helmut Zangenfeind, Puchheim; Jürgen Burchardi, and Josef Lederer, both of Neubiberg, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

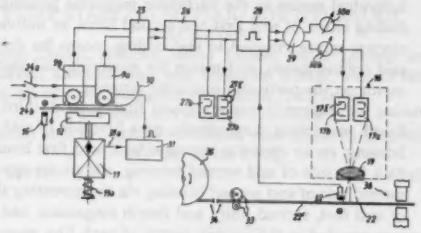
Filed Dec. 9, 1976, Ser. No. 748,721

Claims priority, application Germany, Dec. 13, 1975, 2556281

Int. Cl.² G03B *27/52*

U.S. Cl. 355—41 **28 Claims**

1. Apparatus for the application of indicia to receptacles for films and to associated films, comprising means for transporting successive receptacles and successive associated films along discrete first and second paths; first and second adjustable marking units respectively adjacent said first and second paths and respectively including a first device for applying different first indicia to successive receptacles and a second device for applying different second indicia to successive films, each of said first indicia being normally related to one of said second indicia; first and second detector means for respectively scanning said first and second paths and for respectively transmitting first and second signals on detection of receptacles and films in predetermined positions relative to the corresponding units; means for synchronizing said devices so as to insure the application of related first and second indicia in response to each actuation of said units, including means for



blocking the actuation of at least one of said units in the absence of at least one of said signals; and means for adjusting one of said units upon each actuation of said one unit so as to set the respective device for the application of a different indicium.

4,073,589

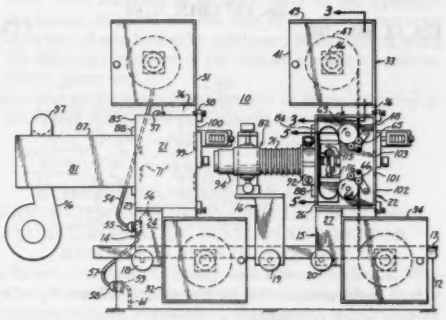
IMPROVED OPTICAL PRINTER

Harold A. Scheib, Encino, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Feb. 13, 1976, Ser. No. 657,341

Int. Cl.² G03B *27/48*

U.S. Cl. 355—50 **3 Claims**



1. In an optical image printer wherein images are copied from a first film onto a photographically sensitive second film, the improvement comprising in combination:

a relatively stationary structure having a bed and including means for providing electric energizing power;

a first carriage slidable along said bed;

a second carriage slidable along said bed;

a projector having a first apparatus including a first housing mounted on said first carriage for receiving said first film and first means in said first housing for positioning said received first film, said projector including means operatively associated with said first apparatus for illuminating said positioned first film and forming a luminous image;

a camera operatively associated with said projector and having a second apparatus including a second housing mounted on said second carriage for receiving said second film and second means in said second housing for positioning said received second film, said camera including means operatively associated with said second apparatus for receiving said luminous image from said projector and projecting said received luminous image onto said positioned second film;

first, second, third and fourth film magazines of identical construction for selectively supplying and receiving either

of said first and second films, each of said first, second, third and fourth film magazines having an individual magazine housing, individual means for rendering said magazine housing light tight, an individual mounting shoe, individual means in the particular magazine housing for coiling either of said first and second films, an individual electric motor coupled to said coiling means for driving said coiling means, and means for mounting said electric motor on the particular magazine housing;

means for releasably mounting said first, second, third and fourth magazines, respectively, on a first side of said first housing, on an opposite second side of said first housing, on a first side of said second housing, and on an opposite second side of said second housing via the mounting shoes of said first, second, third and fourth magazines; and

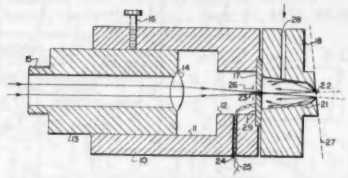
means coupled to the electric motor of each film magazine for selectively connecting each electric motor to said electric energizing power providing means.

4,073,590

LASER TOTAL REFLECTOMETER

R. Bernard Brown, Upper Marlboro, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 18, 1976, Ser. No. 742,815
Int. Cl.² G01N *21/48*
U.S. Cl. 356—209 **7 Claims**



1. A reflectometer for measuring the reflectivity of a test surface which comprises:

a housing,

said housing including a large passage in one end and a smaller passage in the opposite end with said passages axially aligned along the length of said housing;

a lens holder extending into said large passage in said housing with a passage therethrough in coaxial alignment with the large passage in said housing;

a focusing lens secured on the inner end of said lens holder for focusing light on an optical axis in alignment with the axis of said housing;

a mirrored wall element including a mirrored conical inner wall secured in axial aignment with said housing coaxial with said optical axis,

said mirrored wall element including an outlet end with an aperture therein centered on said axis with said outlet end having a curved surface at a slight angle with respect to the optical axis;

a radiation detector secured betrween said smaller-passage end of said housing and said mirrored wall element,

said radiation detector including a passage therethrough on the optical axis, and

means for positioning said lens holder in said housing,

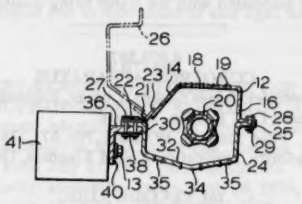
whereby radiation focused by said lens will be centered on said aperture in said mirrored wall element and focused to a point at said passage in said radiation detector.

4,073,591

COMPOSITE U JOINT GUARD-STEP

Gary N. Heitzman, Washington, and Norma G. Shook, Morton, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 3, 1977, Ser. No. 774,006
Int. Cl.² F16C *1/06*
U.S. Cl. 403—24 **10 Claims**



1. A composite "U" joint guard-step, comprising:

a first member having first and second flanges and a middle portion and being of an elongated channel and inverted "U" configuration, said middle portion being generally planar and generally horizontal in the installed position over a "U" joint and having a non-skid means thereon and being of a strength sufficient for providing a step for an operator, said first member being of a configuration sufficient for extending over and being spaced from a "U" joint;

a second member having first and second flanges extending outwardly from said second member, and being of an elongated channel configuration and of a size sufficient for mating with said first member while being spaced from the "U" joint and, in combination with said first member, encompassing said "U" joint;

first means for releasably maintaining the first member in substantial mating alignment relative to the second member flanges; and

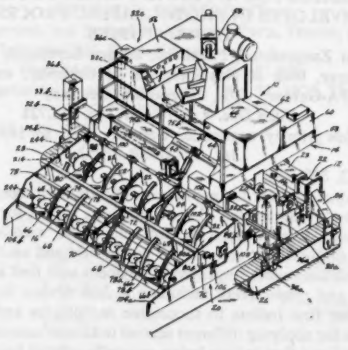
second means for maintaining the second member at a preselected position relative to said "U" joint.

4,073,592

METHOD OF PAVING

Harold W. Godberson, and Gary L. Godberson, both of Ida Grove, Iowa 51445

Filed Jan. 19, 1976, Ser. No. 650,467
Int. Cl.² E01C *23/02*
U.S. Cl. 404—89 **3 Claims**



1. A method of concurrently laying a multiple layered pavement on a base surface by use of a single machine having a normal direction of movement, said machine comprising:

a movable frame;

a first means attached to a front portion of said frame for receiving a first composition;

a first strike-off means attached to said frame behind said first receiving means and being positioned generally transversely of the normal direction of movement of said frame for determining a top level of said first composition;

a second means attached to said frame for receiving said second composition and depositing said second composition on top of said first composition; and

a second strike-off means attached to said frame behind said second receiving means and being positioned generally transversely to the normal direction of movement of said frame for determining a top level of said second composition; said method comprising:

depositing a first homogeneous cementitious composition in a plastic condition on said base surface in front of said first means for receiving said first composition;

leveling said first composition with said first strike-off means;

depositing a second homogeneous cementitious composition in a plastic condition into said second means for receiving the second composition;

leveling said second composition by use of said second strike-off means; and

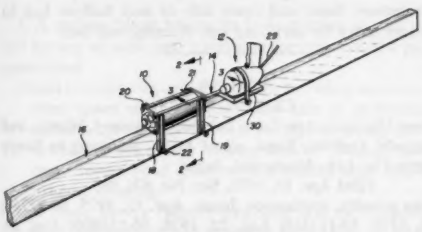
whereby all of the steps of said method are performed simultaneously.

4,073,593

METHOD AND APPARATUS FOR PROVIDING A POWER SCREED BOARD

Nelson "Jack" Storm, Rossville, Ill., assignor to Custom Trailers Mfg., Inc., Westville, Ill.

Filed July 12, 1976, Ser. No. 704,297
Int. Cl.[2] E01C *23/06*
U.S. Cl. 404—114 **3 Claims**



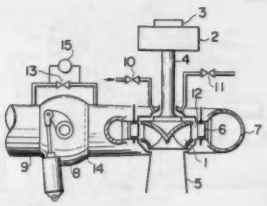
1. A power screed of the type having a screed board, a vibration element for vibrating said screed board, and a source of power for operating said vibration element, said power screed being of a knock-down construction for on-site assembly and disassembly and comprising, in combination, a length of board usable as a temporary screed board, whereby a disposable and replaceable length of board suitably proportioned for a particular job can be simply selected for the screed board; a light-weight vibration element having a housing, an unbalanced rotating element rotatably retained within said housing, and adjustable clamping means integrally formed with said housing for quickly and detachably clamping said vibrator to said length of board, whereby said vibration element is detachable and useable in conjunction with any selected length of board; and a light-weight power hand drill providing a source of power for said vibration element and adapted to be quickly and detachably affixed to said selected length of board and detachably coupled to said vibration element, whereby said source of power is detachable and useable in conjunction with any such vibration element; whereby an inexpensive, light-weight power screed of a knock-down construction for on-site assembly and disassembly is provided simply by selecting any available suitable length of board and detachably clamping the vibration element and the source of power to it and then coupling the vibration element and the source of power together.

4,073,594

PUMP STARTING METHOD FOR HYDRAULIC MACHINERY

Nobuho Takagi, Hitachi; Mituo Takase, Mito; Takashi Itoh, Ibaraki; Katsumi Seno, and Toshihiko Koseki, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed June 4, 1976, Ser. No. 692,995
Claims priority, application Japan, June 11, 1975, 50-69626
Int. Cl.[2] F01D *17/00*
U.S. Cl. 415—1 **8 Claims**



1. A pump starting method for hydraulic machinery wherein a runner is brought into no discharge operation in water at flow rate 0 in pump starting, said method comprising the steps of:

a main valve included in an inlet valve to the hydraulic machinery disposed on the side of an upper reservoir upstream of said hydraulic machinery being opened when the discharge pressure of the runner reaches a predetermined value; and

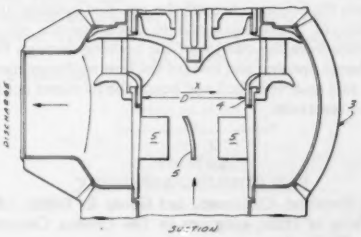
adjustable guide vanes being opened to begin pumping-up while said main valve moves to be fully opened.

4,073,595

METHOD AND MEANS FOR ABRUPTLY TERMINATING THE FLOW OF FLUID IN CLOSED FLUID CIRCULATING SYSTEMS OF NUCLEAR REACTOR PLANTS OR THE LIKE

Otto Schiele, Neustadt, Germany, and Dusan Florjancic, Winterthur, Switzerland, assignors to Klein, Schanzlin & Becker Aktiengesellschaft, Frankenthal, Germany

Filed Sept. 4, 1973, Ser. No. 394,210
Claims priority, application Germany, Sept. 2, 1972, 2243365
Int. Cl.[2] F03B *15/06*; F04D *1/10*; F01D *17/00*; F15D *1/00*
U.S. Cl. 415—143 **3 Claims**



1. In a closed circuit for the circulation of a fluid, particularly in the primary cooling circuit of a nuclear reactor plant, wherein the fluid is circulated by at least one centrifugal pump which operates without catitation at normal system pressure, the improvement which consists in the provision of an arrangement for effecting the operation of said pump with full cavitation in response to a drop of said system pressure below said

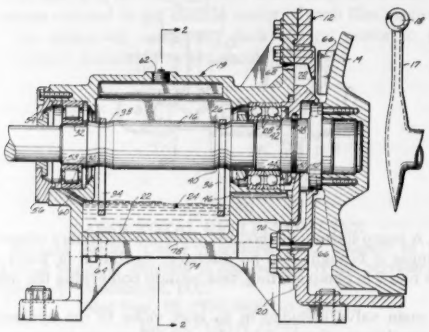
normal pressure to stop circulation of the fluid when a leak occurs in the primary cooling circuit, said arrangement including means for influencing the net positive suction head of said pump over the entire range of fluid flow.

4,073,596

LUBRICANT COOLING FOR HIGH-SPEED PITOT PUMP

John W. Erickson, Huntington Beach, and Carter P. Williams, La Crescenta, both of Calif., assignors to Kobe, Inc., Huntington Park, Calif.

Filed Mar. 18, 1976, Ser. No. 667,891
Int. Cl.[2] F01D *25/24*
U.S. Cl. 415—180 **50 Claims**



1. In a pitot pump having a fixed housing having a hollow interior, a rotatable casing in the interior of the housing, a fixed pitot tube for withdrawing pressurized fluid from within the casing, and bearing means for mounting the casing for rotation in the interior of the housing; improved means for cooling the bearing means during rotation of the casing, comprising:

a shell located adjacent to the housing, the shell having a hollow interior forming a reservoir for containing a supply of lubricant;

means for lubricating the bearing means with lubricant removed from the reservoir;

a gas inlet opening communicating between the atmosphere and the hollow interior of the housing;

heat exchange means in heat transfer contact with the reservoir shell;

a gas discharge opening communicating with the hollow interior of the housing and facing toward the heat exchange means; and

means for generating a gas pressure gradient in the interior of the housing with rotation of the casing to draw air from outside the housing through the gas inlet opening into the interior of the housing and to discharge the air under pressure from the interior of the housing through the gas discharge opening and toward the heat exchange means to cool said reservoir shell and hence the lubricant contained in the reservoir.

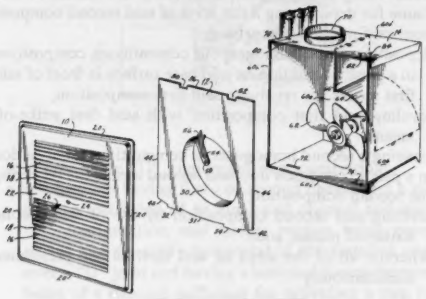
4,073,597

FAN HOUSING ASSEMBLY

David A. Barnhart, Cincinnati, and Gordy E. Loftin, Middletown, both of Ohio, assignors to The Celotex Corporation, Tampa, Fla.

Filed Jan. 28, 1977, Ser. No. 763,290
Int. Cl.[2] F04D *29/62*; F24F *13/08*
U.S. Cl. 415—201 **4 Claims**

1. In a fan housing assembly comprising a generally rectangular hollow box having an open side, a bottom wall and a top wall, said open side having a predetermined vertical open dimension, an exhaust fan mounted inside said hollow box, baffle means mounted in said hollow box, said baffle means partially surrounding said fan, outlet means penetrating a wall said box so that air may be exhausted from said box, an orifice pan arranged to partially close said open side to restrict air flow into said hollow box, said orifice pan having a circular opening in alignment with said exhaust fan, and a ventilating grille attachable to said orifice pan to form a closure for said open side, the improvement in which said orifice pan has outwardly extending fingers spaced apart with respect to each other along one edge thereof, the edge of said orifice pan opposite said one edge being spaced from said one edge a distance greater than said predetermined vertical open dimen-



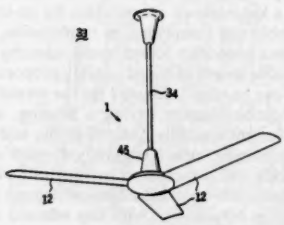
sion of said open side, said bottom wall of said box having slots therein spaced apart a distance equal to the distance between said fingers and being adapted to receive said fingers, and top wall of said box having pairs of inwardly extending detents adapted to receive said opposite edge of said orifice pan, said opposite edge of said orifice pan further having cut out portions located so that when said orifice pan is in its engaged position, a tool can be inserted therein to disengage said orifice pan from said fan housing box, whereby said orifice pan can be easily removed from said open side of said hollow box to permit easy entry for servicing and cleaning said fan.

4,073,598

CEILING FAN

Taketomo Mizutani, Aza-Taka; Takaharu Yasunori, Himeji, and Kazuyoshi Yoshimi, Kasai, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Apr. 14, 1976, Ser. No. 676,888
Claims priority, application Japan, Apr. 17, 1975, 50-52743; Aug. 8, 1975, 50-111538; Aug. 22, 1975, 50-116300; Aug. 29, 1975, 50-119407
Int. Cl.[2] F04D *29/64*
U.S. Cl. 416—5 **8 Claims**



1. A ceiling fan comprising:

a motor having a stator with a coil winding;

a vertical shaft extending through the center of said stator and having portions positioned above and below said stator;

a rotor positioned outwardly of said stator and rotatable with respect thereto;

a protecting member having an upper portion and at least one bent portion extending downwardly therefrom, said bent portion including a base;

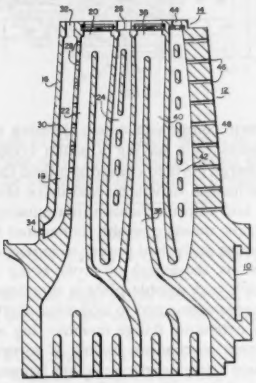
said upper portion of said protecting member having a central opening through which said protecting member is mounted on said portion of said vertical shaft positioned below said stator, said base being located lower than said stator coil winding.

4,073,599

HOLLOW TURBINE BLADE TIP CLOSURE

James M. Allen, Bromall, Pa., and Thomas M. Szewczuk, Claymont, Del., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 26, 1976, Ser. No. 717,967
Int. Cl.[2] F01D *5/18*
U.S. Cl. 416—97 R **1 Claim**



1. A turbine blade having its main portion of cast material and having at least two internal serpentine coolant passages, comprising:

means forming one coolant passage including an outer return bend space on the leading edge side of an intermediate exhaust opening for the first passage in the tip portion of the blade, and means forming another passage having an outer return bend space on the trailing edge side of said exhaust opening;

said blade having radially extended wall portions along at least the convex and concave face sides of said blade projected in a radially outward direction from said return bend spaces and being devoid of said extended walls in the area of the blade tip around said exhaust opening, said extended wall means including retaining grooves formed in the facing surfaces to receive cover plate means;

cover plate means of a weldable material substantially closing said return bend spaces, said cover plate means comprising a pair of plates for each return bend space, each pair of plates including a lapping joint and each plate having a dimension in a leading-to-trailing blade edge direction which accommodates entry of the plate into the grooves from the area around said exhaust opening;

said extending wall portions include transverse walls, extending between the walls along the convex and concave face sides of said blade, at the ends of said walls opposite exhaust opening, said transverse walls including retaining grooves to receive the leading and trailing end edges respectively of said cover plates means; and

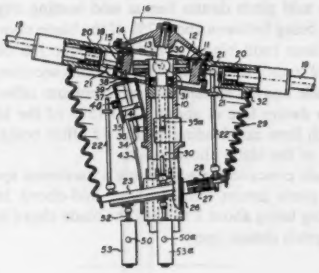
means for holding said cover plate means in position in said grooves comprising a brazed joint between said plate means and said extended walls and pin means projecting through said cover plate means and into said return bend spaces to prevent movement of said plate means back out of said grooves, said pin means being welded to said cover plate means.

4,073,600

DAMPING MECHANISM FOR THE ROTOR HUB OF A HELICOPTER FOR GROUND RESONANCE AND WADDLE AND ITS COMBINATION WITH THE ROTOR

Glidden S. Doman, West Chester, Pa., assignor to William Gallagher, West Chester, Pa.

Filed June 14, 1976, Ser. No. 695,737
Int. Cl.[2] B64C *27/52*
U.S. Cl. 416—140 **18 Claims**



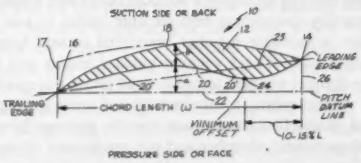
1. A damping mechanism for damping the oscillations of the hub of a rotor head of a helicopter having a fixed point and a non-rotatable gimbal joint with rings for the hub and a linkage between a pilot stick and a swash plate comprising a fluid dashpot having a cylinder with closed ends, attaching means at one end of the cylinder, dashpot piston means including a dashpot piston slidable in the dashpot cylinder providing fluid restraint to piston movement and a dashpot piston rod extending through the other end of the dashpot cylinder and having ends, one end of the piston rod being secured to the dashpot piston, attaching means carried by the other end of the piston rod, spring means between the dashpot cylinder and the dashpot piston means providing spring restraint to movement of the dashpot piston means, the dashpot attaching means being suitable for attaching the dashpot between a ring of the gimbal joint and a fixed point on the helicopter, and the damping mechanism with its fluid damper and spring means connected in tandem providing a substantial delay between the oscillation of of the dashpot and the signal output of the dashpot.

4,073,601

MARINE PROPELLER

Robert F. Kress, Grand Rapids, Mich., assignor to Dana Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 530,696, Dec. 9, 1974, abandoned. This application June 14, 1976, Ser. No. 695,771
Int. Cl.[2] B63H *1/26*
U.S. Cl. 416—242 **2 Claims**



1. A marine propeller having specially configurated blades exhibiting resistance to ventilation and cavitation at high speed operation, each blade including a leading edge, a trailing edge, a face constituting a pressure side, and a back constituting a suction side;

said face having a contour consisting of a convex surface

extending from said leading edge to a transition zone about 20–25% of the blade chord length toward said trailing edge, and a concave surface extending the remainder of the chord length to said trailing edge;

said convex and concave surfaces having curvatures defined relative to reference pitch datum lines at particular radial blade sections, said reference line at any particular radial blade section being a straight line outside of said blade, intersecting said blade trailing edge, and at an angle ϕ to a plane transverse to the propeller axis, the arc tangent of said angle ϕ being the blade pitch divided by $2\pi r$, where r is the distance of the particular radial blade section from the propeller axis; said blade having its maximum set back from said pitch datum line at said leading edge, said set back being between about 7% of the blade chord length at the inner radii blade sections to about 1% of the blade chord length at the outer blade chord sections;

said blade convex surface having minimum offset from said pitch datum line at about 10 to 15% of the blade chord length from said leading edge, said offset being about 1 to 2½% of the blade chord length;

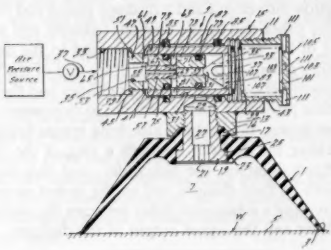
said blade concave surface having a maximum spacing from said pitch datum line at about mid-chord length, said spacing being about 2 to 3½ of the blade chord length from said pitch datum line.

4,073,602

VACUUM PRODUCING DEVICE

Harlan R. Cagle, Cheboygan, Mich., assignor to Sahlin International Inc., Birmingham, Mich.

Filed Apr. 12, 1976, Ser. No. 676,082
Int. Cl.² F04F 5/52
U.S. Cl. 417—185 **18 Claims**



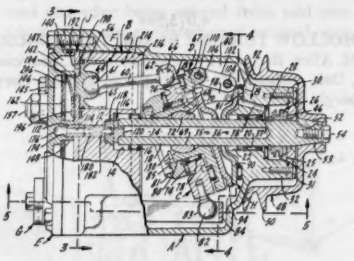
1. A vacuum producing device comprising a housing having an inlet means for pressurized air and an outlet means for pressurized air, said housing having a chamber adjacent said outlet means, a first passage in said housing providing for flow of pressurized air from said inlet to said chamber, venturi means supported in the housing in said first passage between said inlet means and chamber and including a vacuum chamber, said housing including a vacuum outlet and passage means continuously connecting said vacuum outlet to said vacuum chamber, a movable member supported in said housing and defining a wall of said vacuum passage means and having a surface thereon exposed to pressurized air on the upstream side of the venturi means, a valve positioned upon seating to close the end of said first passage and thereby prevent flow of pressurized air to said chamber and the production of vacuum by said venturi means, said movable member being operatively connected to said valve so that movement of said member as a result of sufficient pressure thereon from said pressurized air provides for unseating of the valve to permit air to flow through the first passage to produce vacuum by said venturi means, and spring means in the housing urging the valve to a seated position to close the first passage.

4,073,603

VARIABLE DISPLACEMENT COMPRESSOR

Frederic Henry Abendschein, Columbia, Pa.; John Saxon Ivey, Bloomfield Hills, Mo.; Richard W. Roberts, Lombard, Ill., and Dwight L. Tothero, York, Pa., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Feb. 6, 1976, Ser. No. 655,799
Int. Cl.² F04B 1/26; F16H 23/08
U.S. Cl. 417—222 **7 Claims**



1. A compressor comprising means defining a plurality of gas working spaces each having a piston cooperating with suction and discharge ports to compress a fluid therein; a drive shaft; a cam mechanism driven by said drive shaft; a wobble plate driven by said cam mechanism in a nutating path about the drive shaft axis; means operably connected between said wobble plate and the individual pistons to impart reciprocating drive to said pistons, the length of stroke being a function of the angle at which said wobble plate is supported relative to the drive axis; means connected to said drive shaft including at least one axially extending flange member; lug means associated with said cam mechanism having a portion in spaced, juxtaposed relation with a surface on said flange; a pivot link attached at one end thereof to said flange and at the other end thereof to said lug means, said lug means being spaced from the axis of said drive shaft so that said cam mechanism is pivoted at a point not coincident with said drive shaft axis, there being no drive connection at the drive shaft axis between said cam mechanism and said drive shaft, said link being positioned between said flange and said lug means so that the torque is transmitted from said drive shaft to said cam mechanism without producing a substantial bending moment on said pivot link.

4,073,604

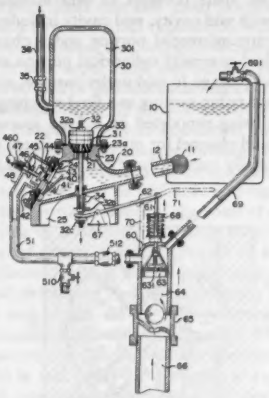
CONSTRUCTION FOR A WATER HAMMER TYPE PUMP

Chun-Pa Chen, 10A, Lane 10, Hsin Sheng S. Road, Taipei, China /Taiwan

Filed Aug. 19, 1976, Ser. No. 715,904
Int. Cl.² F04F 7/02; F16K 17/12, 17/06
U.S. Cl. 417—226 **7 Claims**

1. An improved construction of a water hammer type pump comprising a base, a pump body, means for supplying water to said pump body, a pressure tank secured to said pump body, said pressure tank having a water outlet, a discharge valve disposed between the pressure tank and the pump body for allowing water from the pump body to enter the pressure tank, a waste water outlet including a hole and a flat plate pivotally secured to an inside wall of the pump body so that upon back and forth movement the plate will open and close said hole alternately allowing water to escape from the pump body and preventing such escape for the purpose of initiating water hammer force to force water from the pump body to the pressure tank by way of the discharge valve provided therebetween, the improvement wherein the discharge valve comprises an assembly including a valve stem, a resilient valve piston shaped as an inverted truncated cone disposed on said stem, a plurality of adjustable weights removably mounted on the valve piston for controlling the operation of said piston,

and a spring disposed around said valve stem and biassing the same to urge the weights against the piston to aid in the accuracy and sensitivity of the operation, said assembly being disposed in a hole in said pump body generally corresponding to the shape of the valve piston and including means for slidably supporting the valve stem in said hole in said pump body.

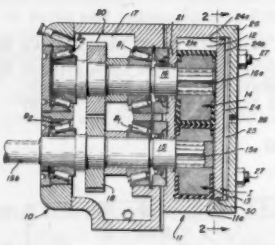


4,073,605

ROTARY PUMP CONSTRUCTION WITH CLEANING FEATURE

Alden H. Wakeman, Lake Mills, and Leonard R. Heiliger, Fort Atkinson, both of Wis., assignors to Crepaco, Inc., Chicago, Ill.

Filed Sept. 15, 1976, Ser. No. 723,456
Int. Cl.[2] F04B *49/08*; F04C *29/00*
U.S. Cl. 417—283 **9 Claims**



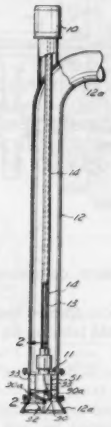
1. A positive fluid pump comprising a housing having formed therein a pump chamber and an outlet and an inlet relatively spaced with respect to one another and communicating with said chamber, said chamber being provided with a pair of opposed side walls, one side wall having a portion thereof in sealing engagement therewith and movable relative to the other side wall between first and second positions; impellers engaging one another and rotatably mounted within said chamber and separating the inlet from the outlet when said wall portion is disposed in said first position and adjacent corresponding impeller end faces, said side wall portion being movable independently of said impellers and, when in said second position, being recessed from said pump chamber and forming therewith a sealed fluid by-pass communicating with said chamber and interconnecting said inlet and outlet, said impellers being axially movable independently of one another and the chamber side walls when said side wall portion assumes said second position; and selectively actuated means communicating with said side wall portion and when actuated to a first selected condition, effecting retention of the side wall portion in said first position and, when actuated to a second selected condition, enabling the side wall portion to be movable from said first position to said second position, said actuated means being sealed from the pump chamber by said side wall portion.

4,073,606

PUMPING INSTALLATION

J. Marlin Eller, 204 NE. 8th Terrace, Deerfield Beach, Fla. 33441

Continuation-in-part of Ser. No. 629,519, Nov. 6, 1975, abandoned. This application Jan. 17, 1977, Ser. No. 759,895
Int. Cl.[2] F04D *29/10*
U.S. Cl. 417—424 **13 Claims**



1. In a pumping apparatus comprising:
a power drive means,
an annular casing at least several feet long extending down from said power drive means,
a rotary drive shaft unit at least several feet long driven by said power drive means and extending down inside said casing,
and an axial flow pump in the lower end of said casing having a rotary pump shaft below the lower end of said drive shaft unit,
the improvement which comprises the combination of:
a slidable coupling means connecting the lower end of said drive shaft unit to the upper end of said pump shaft for imparting the rotation of the drive shaft unit to the pump shaft and at the same time permitting axial expansion and contraction of the drive shaft unit relative to the pump shaft,
an anti-friction radial bearing assembly engaging the pump shaft below said coupling and positioning the pump shaft in vertical alignment with said drive shaft unit;
a fluid seal for the pump shaft below said bearing assembly, said fluid seal comprising a fixed ring which rotatably passes the pump shaft, a second ring which sealingly engages said fixed ring around the complete circumference of the pump shaft, a spring biasing said second ring against said fixed ring and coupling said second ring to said pump shaft for rotation with the pump shaft, and a flexible, elastomeric, annular bellows clamped to the pump shaft around its complete circumference at a location spaced from said rings and having a radially disposed annular end which engages said second ring;
a tube surrounding said drive shaft unit inside said casing;
a housing for the slidable coupling attached to the lower end of the tube;
and a housing for the bearing assembly and the pump shaft

seal attached to the lower end of said housing for the coupling;

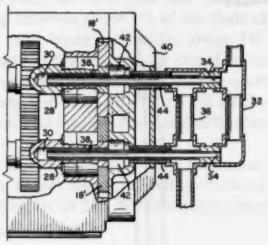
said housings and said tube being filled with oil to lubricate said shaft unit, said coupling and said bearing assembly.

4,073,607

GAS COMPRESSOR SYSTEM

Paul Dale Webb, Tioga, Pa., and Henry William Morse, Savona, N.Y., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed July 29, 1976, Ser. No. 709,653
Int. Cl.[2] F04C *29/04*
U.S. Cl. 418—86 **11 Claims**



1. A gas compressor system, comprising:

a housing:

said housing having a bore formed therewithin;

first means coupled to said housing for admitting gas to said bore;

second means coupled to said housing for discharging compressed gas from said bore;

means, movably mounted within said bore, operative for compressing gas admitted by said first means and for conducting gas compressed thereby to said second means;

said compressing and conducting means including a shaft which has an axial bore formed therewithin and a piston carried by said shaft; further including

means coupled to said second means for cooling compressed gas discharged by said second means;

means for introducing cooled compressed gas into said axial bore via one end of said shaft for effecting a cooling of said shaft, and means for venting such cooling gas from said shaft via said one end thereof; and

means intercoupling said gas cooling means with said gas introducing means; wherein

said piston is a rotary piston, is overhung on said shaft and, relative to said shaft, has inboard and outboard faces;

said shaft is supported in said housing and is rotatively driven about an axis, to rotate said piston;

said housing has an end cover having an innermost surface which forms an interface with said outboard face of said rotor, and said housing further has an annular cavity formed about said axis which opens onto said interface; and

at least one of said cooled gas-introducing and -venting means opens onto said cavity.

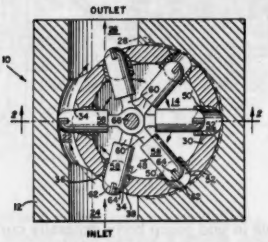
4,073,608

POSITIVE DISPLACEMENT VANE TYPE ROTARY PUMP

Charles A. Christy, P.O. Box 485, Tijeras, N. Mex. 87056

Continuation-in-part of Ser. No. 564,289, April 2, 1975, Pat. No. 4,019,840. This application Dec. 1, 1976, Ser. No. 746,252
Int. Cl.[2] F03C *3/00*
U.S. Cl. 418—241 **15 Claims**

1. A vane rotary device comprising a housing member having a cavity extending therethrough, first and second end closure members, a rotor disposed in said cavity and rotatably supported in said housing member, said rotor having a plurality of radial openings therein, vane means disposed in each of said radial openings for sliding movement therein and rotary movement along with said rotor, an inlet passage and an outlet passage on spaced apart portions of said housing member communicating with said cavity, said cavity including a generally cylindrical circumferential portion and a channel offset radially beyond said generally cylindrical portion and extending from said inlet passage to said outlet passage, said channel in operation of said pump serving as a fluid pumping chamber, said vane means being supported on a fixed journal element concentric with said channel for pivotal movement thereabout and extending radially outwardly of said rotor and in pressure



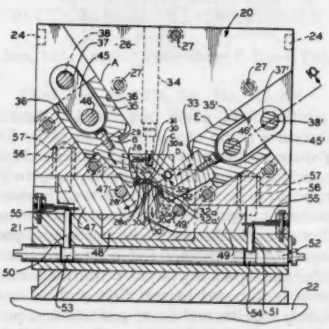
sealing relationship with said channel while being rotated through said channel by said rotor thereby pumping fluid from said inlet passage to said outlet passage, said cylindrical portion extending between said outlet passage and said inlet passage, said vane means being retracted within said rotor as said rotor passes said cylindrical portion and a circumferential groove extending in said cylindrical portion and having opposite ends confined within said cylindrical portion, terminating short of reaching said inlet and outlet passages providing communication between radial openings simultaneously passing said cylindrical portion to relieve pressure therein and thereby to facilitate radial movement of said vane means.

4,073,609

APPARATUS FOR MOLDING IRREGULAR SHAPES

John R. Petrenchik, Pepper Pike, Ohio, assignor to Mercury Machine Company, Warrensville Heights, Ohio

Filed Aug. 19, 1976, Ser. No. 715,857
Int. Cl.[2] B28B *7/04*
U.S. Cl. 425—442 **4 Claims**



1. Mold structure for forming a core shape for incorporation in an airfoil part, such as a blade, a vane or the like, and said airfoil part core having passage-forming deformations with surfaces extending in at least two non-parellel planes; said mold structure comprising an upper mold portion and a lower mold portion having complementary interfitting faces between them, defining a generally horizontal chamber curving in

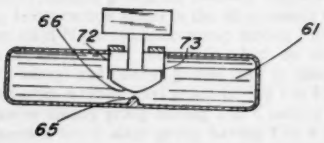
section, and separable in a given generally vertical direction, said horizontal chamber having a generally convex upper surface and a generally concave lower surface; interfitting parts extending from one said mold portion into said other mold portion to insure exact registration when said two mold portions are assembled; coacting core-forming blocks movably held part in said upper mold portion and part in said lower mold portion; each of said blocks having a core-forming partial surface presented inwardly thereof including passage-forming formations complementary to said airfoil core part deformations to be formed; said passage-forming formations having surface portions at right angles to the associated partial surface requiring said blocks to be withdrawn at right angles to said partial surface portions respectively; some of said blocks being withdrawable in a direction different from the direction of withdrawal of others of said blocks; all of said core-forming partial surfaces on all of said blocks coacting to completely enclose said airfoil core part in said generally horizontal chamber when said blocks are in their innermost positions; gate means communicating with said chamber for introduction of molding material into said closed chamber; means moving said blocks held in said upper mold portion at right angles to the asssociated core-forming partial surface inwardly to enclose said chamber and means moving said blocks held in said upper mold portion at the same right angle outwardly, each in line with the associated passage-forming formation surfaces, sufficient to release an airfoil part from said chamber; at least two of said core-forming blocks held in said lower mold portion are spaced apart and having passage-forming formations at two different angles to the direction of separation of said two mold portions; said means moving each of said blocks initially in line with said passage-forming formation surfaces comprises a swing lever block having a pivotal mounting in said lower mold portion; a radius from said pivotal mounting to said associated partial formation surface in its innermost, chamber-closing position is substantially at rignt angles to said direction of withdrawal axially in line with said associated formation surface, whereby upon initial pivoting of said swing lever block to release the finished core shape the swing lever block is caused to move said passage-forming formations substantially along its axis; and another block held in said lower mold portion between said spaced two blocks has passage-forming formations complementary to said airfoil part deformations lying in a plane parallel to the direction of separation of said two mold portions; and means moving said two mold portions apart.

4,073,610

APPARATUS FOR PRODUCING A FOLDABLE PLASTIC STRIP

Bernard K. Cox, R.R. 5, Box 293, Connersville, Ind. 47331

Filed Feb. 5, 1976, Ser. No. 655,518
Int. Cl.² B29F 1/00
U.S. Cl. 425—577 **2 Claims**



1. An injection mold for use in producing a plastic piece comprising:

a mold housing having a cavity in which a plastic piece may be formed, said housing further having inlet means operable to receive and direct liquid plastic into the cavity;

a first elongated projection having a continuous arcuate surface, said first projection being fixedly mounted to the inside wall of said housing and extending at most one-quarter of the distance across the cavity;

a second elongated projection having a continuous arcuate surface, said second projection being positioned opposite said first projection and to be slidable between a pair of rigid, elongated guide brackets which extend into the cavity, said guide brackets being fixed to said mold housing to exclude said liquid plastic from flowing behind said second projection; and,

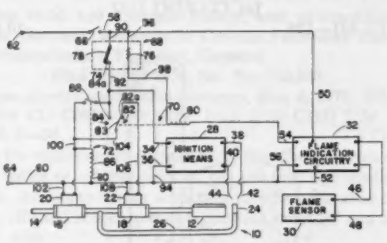
control means including a push bar in contact with said housing and connected to said second projection for reciprocating said second projection in the direction of said first projection at least one-half the distance across the cavity subsequent to liquid plastic being injected into the cavity thereby forming a portion of reduced thickness in the plastic piece.

4,073,611

CONTROL SYSTEM FOR GAS BURNING APPARATUS

Charles L. Kaduki, Auburn, and Richard D. Stoneking, Corunna, both of Ind., assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed Oct. 15, 1976, Ser. No. 732,615
Int. Cl.² F23Q 9/14
U.S. Cl. 431—45 **5 Claims**



1. In a gas burning apparatus including a main burner, a pilot burner, a gas supply for said burners, a first electrically controlled valve in said gas supply and operable to supply gas to said pilot burner, and a second electrically controlled valve receiving its gas supply through said first valve and operable to supply gas to said main burner, each of said valves having an electrical operator which is energized to open its respective valve and is deenergized to close its respective valve; a control system for controlling the operation of said valves and effecting ignition of gas supplied to said burners comprising:

electrically energized ignition means for igniting gas flowing from said pilot burner;

an ignition energization circuit for said ignition means;

a normally open valve energization circuit for said first valve operator including a subcircuit connecting said second valve operator in parallel with said first valve operator;

a flame sensor responsive to the presence or absence of flame at said pilot burner;

a flame condition circuit including flame indicating switching circuitry operable by said flame sensor to have a conductive condition in the absence of flame at said pilot burner and a non-conductive condition in the pesence of flame at said pilot burner;

flame relay means having a normally open switch in said valve energization circuit in series with said first valve operator and a normally closed switch in said subcircuit in series with said second valve operator;

said flame relay means further including electrical actuating means connected in said flame condition circuit in series with said flame indication switching circuitry for operating said normally open and normally closed switches whereby said flame relay means is effective to complete the valve energization circuit and interrupt said subcircuit

of said second valve operator in the absence of flame at said pilot burner;

holding relay means in said valve energization circuit and operable in response to energization of said flame relay actuating means for maintaining said first valve operator energized independently of said flame relay means and permitting energization of said second valve operator through said normally closed switch of said flame relay means when flame is established at said pilot burner; and

a normally closed time delay switch connected in series with said valve energization circuit and having an electrical actuator connected in said flame condition circuit in series with said flame indication switching circuitry and operable to open said time delay switch after said flame indication switching circuitry remains in a conductive state for a predetermined time interval in excess of a prescribed ignition period for said pilot burner.

4,073,612

DISPOSABLE CIGARETTE GAS LIGHTER

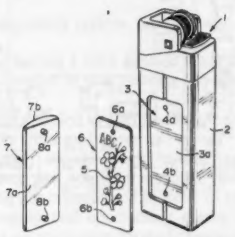
Tomio Nitta, Yokohama, Japan, assignor to Tokai Seiki Co., Ltd., Yokohama, Japan

Filed Mar. 17, 1976, Ser. No. 667,534

Claims priority, application Japan, Mar. 2, 1976, 51-24510[U]; Jan. 2, 1976, 51-56[U]

Int. Cl.² F23Q *2/32*

U.S. Cl. 431—126 **10 Claims**



1. A disposable cigarette gas lighter comprising a plastic gas tank containing therein a liquefied fuel gas, said gas tank having a recess on the surface thereof, lighting means mounted on said plastic gas tank, a printed sheet having printed thereon publicity information, said printed sheet being disposed in the recess, and a transparent plastic lens disposed within said recess and directly attached to the gas tank over the printed sheet to hold and protect the printed sheet, wherein said plastic lens has a projection intergrally fixed thereof on the back surface thereof, and said recess is provided with a hole to receive said projection of said lens, wherein said printed sheet is provided with a perforation to allow said projection of said lens to extend therethrough, said plastic lens has a front surface forwardly curved to form a positive cylindrical lens.

4,073,613

FLARESTACK COANDA BURNERS WITH SELF-ADJUSTING SLOT AT PRESSURE OUTLET

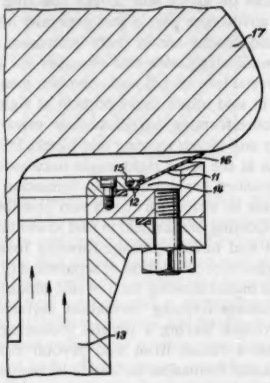
Denis Henry Desty, Weybridge, England, assignor to The British Petroleum Company Limited, London, England

Filed June 23, 1975, Ser. No. 589,085

Claims priority, application United Kingdom, June 25, 1974, 28094/74

Int. Cl.² F23D *13/20*; B05B *1/26*

U.S. Cl. 431—202 **16 Claims**



1. A Coanda unit comprising a supply line for a pressurized gas and a Coanda body positioned across the outlet of the supply line so as to define a slot for discharging the gas along the surface of the Coanda body, one edge of said slot being contiguous with the Coanda surface, the opposite edge of said slot being defined by a resilient flap operatively coupled to said unit, said resilient flap being pre-loaded against said Coanda body so as to keep said supply line closed until a pre-determined gas pressure level is reached and said resilient flap being arranged to flex in response to gas pressures in excess of said pre-determined gas pressure level to form an effective slot width in the range of about 0 to about 0.05 inches, depending on the pressure of the gas supply, so that a stable flame is maintained at variations in gas pressure in excess of said pre-determined gas pressure.

4,073,614

MIXTURE OF BENZONAZINES AND BENZODIOXANES WHICH MAY BE USED AS COLOR FARMERS

Minoru Ozutsumi; Yoshihide Miyazawa, and Masahiko Yamaguchi, all of Tokyo, Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan

Filed July 8, 1975, Ser. No. 594,173

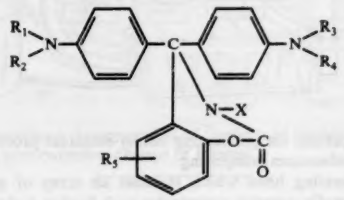
Claims priority, application Japan, July 8, 1974, 49-77348

Int. Cl.[2] D06P *1/00, 3/00;* C07D *265/00, 273/00*

U.S. Cl. 8—25 1 Claim

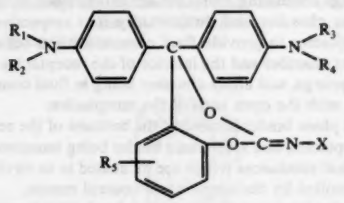
1. A mixture comprising:

a triphenylmethane compound represented by the formula



and,

a triphenylmethane compound represented by the formula



said compounds being present in amounts sufficient to form color;

wherein R_1 and R_3, which may be the same or different, each represents, a lower alkyl group having 1 to 4 carbon atoms, a benzyl group or a phenyl group, in which the aromatic nucleus of the benzyl and phenyl groups may be substituted with a lower alkyl group having 1 to 4 carbon atoms, a lower alkoxy group having 1 to 4 carbon atoms or a di-lower alkylamino group having 1 to 4 carbon atoms in each of the alkyl moieties thereof; R_2 and R_4, which may be the same or different, each represents a benzyl group or a phenyl group in which the aromatic nucleus of the benzyl and phenyl groups may be substituted with a halogen atom or a di-lower alkylamino group having 1 to 4 carbon atoms in each of the alkyl moieties thereof; R_5 represents a hydrogen atom, a lower alkyl group having 1 to 4 carbon atoms, a lower alkoxy group having 1 to 4 carbon atoms, a halogen atom, a di-lower alkylamino group having 1 to 4 carbon atoms in each of the alkyl moieties thereof, a dibenzylamino group, an N-lower alkyl-N-benzyl group having 1 to 4 carbon atoms in the alkyl moiety thereof or an N-lower alkyl-N-phenylamino group having 1 to 4 carbon atoms in the alkyl moiety thereof, in which the aromatic nucleus of the benzyl and phenyl groups may be substituted with a halogen atom, a lower alkyl group having 1 to 4 carbon atoms, or a lower alkoxy group having 1 to 4 carbon atoms; and X represents a lower alkyl group having 1 to 4 carbon atoms; a lower alkenyl group having 2 to 4 carbon atoms, a cyclohexyl group, an aralkyl group having 1 to 4 carbon atoms, in the alkyl moiety thereof or an aryl group, in which the aromatic nucleus of said aralkyl and aryl groups may be substituted with a lower alkyl group having 1 to 4 carbon atoms, a lower alkoxy group having 1 to 4 carbon atoms, a di-lower alkylamino group having 1 to 4 carbon atoms in each of the alkyl moieties thereof, a halogen atom, a nitro group, and when the aralkyl group is a benzyl group, the aromatic nucleus thereof may also be substituted with an N-lower alkyl-N-phenyl group having 1 to 4 carbon atoms in the N-lower alkyl moiety thereof.

4,073,615

STABLE DYE SOLUTION

Roger Lacroix, Huningue, France, and Roland Haberli, Wurenlingen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 8, 1976, Ser. No. 739,407

Claims priority, application Switzerland, Nov. 12, 1975, 14652/75

Int. Cl.[2] D06P *1/00*

U.S. Cl. 8—25 10 Claims

1. Stable dye solution which has a high concentration of dye and is miscible with water in any proportion, which dye solution contains

a. 20 to 40 percent by weight of at least one azo, nitro or anthraquinone dye containing an acid group and,

b. 20 to 80 percent by weight of N-cyclohexylpyrrolidone.

4,073,616

OXIDATIVE AFTER-TREATMENT OF MATERIALS DYED OR PRINTED WITH SULFUR OR VAT DYESTUFFS

Christian Heid, and Johannes Polster, both of Frankfurt am Main, Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Frankfurt, Germany

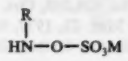
Filed Dec. 2, 1976, Ser. No. 746,888

Claims priority, application Germany, Dec. 6, 1975, 2555046

Int. Cl.[2] C09B *9/00;* D06P *1/22, 1/30;* C11D *7/54*

U.S. Cl. 8—34 6 Claims

1. In the oxidative after-treatment of fiber that has been dyed with a sulfur or vat dye to bring out the final dye shade and fastness, the improvement according to which the after-treatment is effected at a temperature between about 20° and about 105° C, with



or a protonated product thereof,

R being hydrogen $-SO_3M$, and

M being hydrogen, ammonium, or a metal compatible with the after-treatment.

4,073,617

WATER-DILUTABLE SOLUTIONS OF DICYANDIAMIDE-FORMALDEHYDE-PHOSPHORIC ACID CONDENSATES

Robert Bruce Le Blanc, 99 Main St., and Destin Allen Le Blanc, 115 Main St., both of Wickford, R.I. 02852

Filed Apr. 26, 1976, Ser. No. 680,407

Int. Cl.[2] D06M *13/26, 13/44, 1/00*

U.S. Cl. 8—116 P 11 Claims

1. In the process for rendering textile materials fire-resistant wherein dicyandiamide is condensed with formaldehyde and sufficient phosphoric acid ultimately to impart fire-resitance, diluted with water and applied to a textile material, the improvement which comprises effecting the condensation of dicyandiamide, with formaldehyde adding phosphoric acid to produce a solution, and adding additional phosphoric acid more than a day after the reaction and less than about 8 hours prior to the dilution with water, whereby such dilution with water is effected without formation of an insoluble material.

8. A composition capable of being diluted with water to a textle fire-resisting finish, comprising a condensation product of dicyandiamide with about 0.9 – 3 moles of formaldehyde per mole of dicyandiamide in aqueous solution at a pH of about 8 to 13 and an initial addition of about 0.06–0.6 mole of phosphoric acid per mole of dicyandiamide and containing addi-

tional phosphoric acid added more than a day after the initial addition of phosphoric acid but less than 8 hours prior to the dilution of said composition with water whereby such dilution with water is effected without formation of an insoluble material.

4,073,618

ANTI-CORROSIVE AGENT FOR METALS

Tsunesuke Doi, Tama; Hiroshi Komoto, Yokohama; Masazumi Chono, Yokohama; Akira Inoue, Yokohama; Kazuaki Saito, Chigasaki, and Isao Shinozuka, Kawasaki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 667,622, March 17, 1976, Pat. No. 4,028,055. This application Mar. 4, 1977, Ser. No. 774,631
Claims priority, application Japan, Mar. 19, 1975, 50-33392
Int. Cl.[2] C09K *3/00*; C23F *11/04, 11/06, 11/10*; C23G *1/06, 1/18, 1/26*
U.S. Cl. 21—2.7 R 13 Claims

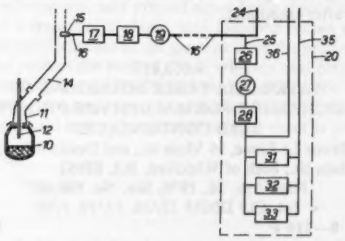
1. A method of inhibiting corrosion of metal surfaces comprising applying to a metal surface a solution or dispersion containing an effective concentration of at least one condensation product of a saturated aliphatic triamine of 9 carbon atoms having a main chain which is branched at the 4-position and having a primary amino group at each carbon atom in a terminal position and at least one member selected from the group consisting of saturated fatty acids, aliphatic hydroxycarboxylic acids, aromatic carboxylic acids, aromatic hydroxycarboxylic acids, natural oil fatty acids, polymers of unsaturated carboxylic acids and amino acids.

4,073,619

SAMPLING GAS FOR ANALYSIS

Robert Lawson, Middlesbrough, England, assignor to British Steel Corporation, London, England

Continuation of Ser. No. 626,045, Oct. 28, 1975, abandoned. This application Mar. 23, 1977, Ser. No. 780,499
Claims priority, application United Kingdom, Oct. 28, 1974, 46432/74
Int. Cl.[2] G01N *1/22*
U.S. Cl. 23—232 R 12 Claims



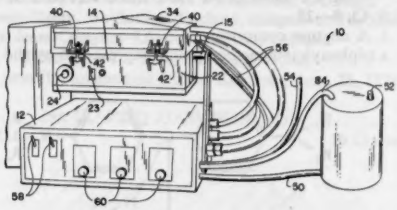
1. A method for the rapid transfer of gas from a sampling probe at a gas source to a gas analyser remote from the gas source to thereby decrease the time interval between sampling and analysis, comprising passing the gas from the probe along a first gas sampling duct intercommunicating at a junction with a second gas sampling duct which transfers the gas sample to the gas analyser; the first gas sampling duct being relatively long compared with the second gas sampling duct and exhausting to the atmosphere after said junction; and second sampling duct having a bleed line just prior to said analyser to exhaust under pressure a proportion of the gas in the second duct to the atmosphere; the gas being transferred along the first duct at a high gas transfer rate relative to the transfer rate along the second duct.

4,073,620

BINDER-SUBSTRATE ANALYZER

Michael James Gray, San Francisco, and Raymond E. Stanton, Alameda, both of Calif., assignors to Gray and Stanton, San Francisco, Calif.

Filed Jan. 3, 1977, Ser. No. 756,311
Int. Cl.[2] G01N *31/06*
U.S. Cl. 23—253 R 13 Claims



1. Apparatus for performing binder-substrate processing of clinical substances comprising:

an operating head which includes an array of generally upwardly opening receptacles each having a closed bottom, temperature control means proximate the closed bottom of the receptacles, and a manifold having an influx chamber, an efflux chamber and a plurality of hollow prongs emanating from the influx chamber through the efflux chamber and downwardly into respective of the receptacles to provide fluid communication between the influx chamber and the interior of the receptacles through the prongs, said efflux chamber being in fluid communication with the open ends of the receptacles;

a solid phase binder located at the bottoms of the respective receptacles, said solid phase binder being immersed in said clinical substances which are incubated in an environment controlled by the temperature control means;

means for inverting the operating head after incubation of the clinical substances; and

means for injecting a washing fluid into the influx chamber of the inverted operating head so that the washing fluid flows upwardly through the prongs and into the receptacles to wash excess of the clinical substances from the solid phase binder, said washing fluid containing said excess draining into the efflux chamber.

4,073,621

READER RECORDER FOR TOXIC GAS CONCENTRATION TAPES

Rame Bull, Mount Prospect; Byron A. Denenberg, Northfield, and Djorde R. Popovic, Chicago, all of Ill., assignors to MDA Scientific, Inc., Park Ridge, Ill.

Filed Feb. 25, 1976, Ser. No. 661,134
Int. Cl.[2] G01D *9/38*; G01N *21/30*
U.S. Cl. 23—254 E 9 Claims

1. A reader recorder device for producing a graph of gas concentration versus time and of total dosage from a portion of gas sensitive tape exposed over a known time period, said device comprising:

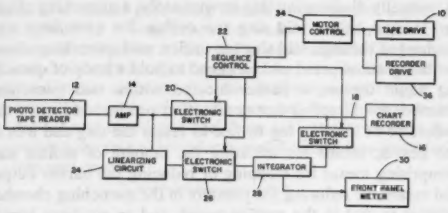
(a) means for reading said gas sensitive tape at a first rate to produce a time varying voltage corresponding to said gas concentration,

(b) means for linearizing the relationship between gas concentration and said varying voltage.

(c) integrator means for performing a voltage versus time integration of the linearized voltage to obtain an electrical signal having a magnitude representative of the area under the graph of said time varying voltage over said known time period, said electrical signal representing said total dosage,

(d) means for recording on chart paper at a second rate said

variation in voltage with respect to time and said total dosage, the relationship between the first and second rates



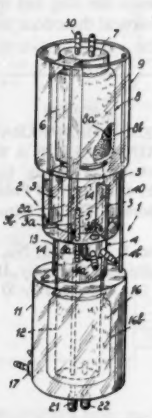
permitting a determination of the time of occurrence of a gas concentration change of interest.

4,073,622

BLOOD OXYGENATOR WITH HEAT EXCHANGER

Libero Luppi, Via 5 Martiri, 13, Mirandola (Modena), Italy

Filed Mar. 21, 1975, Ser. No. 560,753
Claims priority, application Italy, Mar. 25, 1974, 12654/74
Int. Cl.² A61M 1/03
U.S. Cl. 23—258.5 BH **11 Claims**



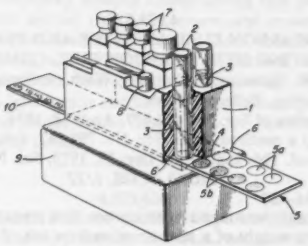
1. A blood oxygenator comprising an upper container and a lower container arranged at a distance therefrom, a tubular member arranged between and connecting said upper and lower containers, concentric cylindrical wall portions defining an annular chamber having an axial extension between said upper and lower containers and surrounding said tubular member, means defining a labyrinth passage in said annular chamber, said labyrinth passage having a start and an opposite end thereof and defining means directing the blood in said labyrinth passage in a direction parallel to said concentric cylindrical wall portions thereof, a heat exchanger unit extending from said upper container through the interior of said tubular member into said lower container, inlet and outlet means for the heating fluid into the heat exchanger, first defoaming means arranged in said upper container and second defoaming means arranged in said lower container, first duct means on one side of said first defoaming means and connecting said opposite end of said labyrinth passage with said upper container, second duct means on the other side of said first defoaming means and extending through the interior of said tubular member around said heat exchanger unit and connecting said upper container with said lower container, first connector means defining a blood inlet at the start of said labyrinth passage for the venous bloody entry, second connector means defining a blood exit at the bottom of said lower container for the arterial blood exit and an oxygen diffuser at said beginning of the labyrinth passage said second duct means ending on one side of said second defoaming means and said second connector means opening with one end thereof at the other side of said second defoaming means and ending with the other end thereof outside said lower lower container, thereby to allow oxygenated blood coming from said labyrinth passage to flow from said upper container past said heat exchanger unit-into said lower container and to undergo a first defoaming action in said first container and after heating action by said heating unit a second defoaming action in said second container.

4,073,623

ANALYTICAL DETERMINATION OF SUBSTANCES IN SOLUTION

Detlef Eugen Bodart, Darmstadt, Germany, assignor to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed Oct. 20, 1976, Ser. No. 734,107
Claims priority, application Germany, Oct. 31, 1975, 2548728
Int. Cl.² G01J 3/52; G01N 21/02
U.S. Cl. 23—259 **7 Claims**



1. A device for the analytical determination of substances in solution by color development of a sample solution and then comparison thereof with a comparison solution in tubes; and comprising a block formation with at least two tube-shaped openings in generally side-by-side adjacency passing therethrough for reception of solution-containing tubes; means providing a slot along the block traversing the ends of said openings for receiving color tables movable at a right angle relative to the openings.

4,073,624

METHOD FOR FLUORINATING COAL

John L. Huston, Skokie; Robert G. Scott, Westmont, and Martin H. Studier, Downers Grove, all of Ill., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Dec. 21, 1976, Ser. No. 752,946
Int. Cl.² C10L 9/02; C07B 9/00
U.S. Cl. 44—1 R **6 Claims**

1. A method for fluorinating coal comprising:

contacting the coal with elemental fluorine at a temperature between 0° and 80° C and at an initial pressure of from 50 to 300 mm Hg;

maintaining the initial pressure of the fluorine until the coal is partially fluorinated;

increasing the pressure of the fluorine over the partially fluorinated coal slowly to from 1100 to 1600 mm Hg; and

maintaining the pressure of the fluorine for a period of time sufficient to completely fluorinate the coal, thereby forming fluorinated coal.

4,073,625
PROCESS FOR PREPARING BRIQUETTES

Yoshio Kiritani, Osaka; Michio Tsuyuguchi, Wakayama; Tetsuo Ibaragi, Wakayama; Katsuhiro Yano, Wakayama; Yoshihiko Sunami; Kunihiko Nishioka, both of Amagasaki, all of Japan, assignors to Sumitomo Metal Industries Limited, Osaka and Sumikin Coke Company Limited, Wakayama, both of Japan

Filed Sept. 29, 1976, Ser. No. 728,008
Int. Cl.[2] C10L *5/00, 5/16*
U.S. Cl. 44—10 R **12 Claims**

1. A process for preparing a briquette comprising the steps of blending a caking substance having a softening point of above 20° C to a coal to be used for making briquettes to yield a blend, mixing the blend at a temperature of above 10° C for 1–10 minutes with a mixer capable of applying mixing energy of more than 0.02KW/kg and briquetting at a normal temperature by using a roll press.

12. A process for preparing a briquette comprising the steps of blending a caking substance having a softening point of above 40° C and a solvent which has the fluidity at normal temperature and is compatible with said caking substance to a coal to be used for making briquettes to yield a blend, mixing the blend at a temperature of above 10° C for 1–10 minutes by using a mixer whose mixing tool is rotated at a speed of more than 5m/sec. peripheral velocity to said blend and a mixer whose mixing tools applies a pressure of more than 45kg/cm^2 to said blend, and briquetting by using a roll press.

4,073,626
HYDROCARBON FUEL ADDITIVE AND PROCESS OF IMPROVING HYDROCARBON FUEL COMBUSTION

Richard W. Simmons, Bellingham, Wash., assignor to Ferrous Corporation, Bellevue, Wash.

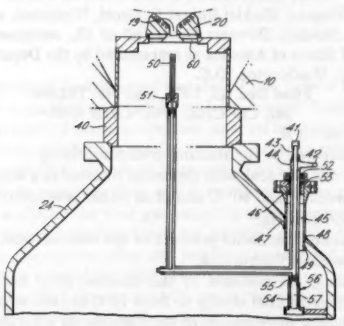
Continuation of Ser. No. 461,877, April 18, 1974, abandoned, which is a continuation of Ser. No. 798,182, Feb. 10, 1969, abandoned. This application Dec. 17, 1975, Ser. No. 641,647
Int. Cl.[2] C10L *1/22*
U.S. Cl. 44—57 **9 Claims**

1. An improved liquid hydrocarbon fuel containing at least 0.003% by weight of a mixture of an iron salt of an aromatic nitro acid and a nitroaliphatic compound having from one to four carbon atoms, the weight ratio of aromatic nitro acid to nitroaliphatic compound ranging from 1:10 to 1:100.

4,073,627
COAL GASIFICATION PLANT

John Alfred Anderson, Knowle, England, assignor to British Gas Corporation, London, England

Filed Nov. 22, 1976, Ser. No. 744,028
Claims priority, application United Kingdom, Nov. 27, 1975, 48813/75
Int. Cl.[2] B01J *3/00*
U.S. Cl. 48—62 R **9 Claims**

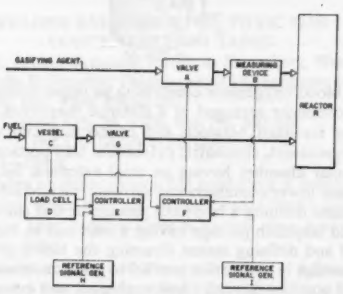


1. In a coal slagging gasifier comprising: a column-like vessel; means for introducing coal or other carbonaceous fuel into the top of said vessel; tuyere means for introducing oxygen and steam into said vessel for gasification of fuel therein; a hearth for collecting molten slag and iron which is formed during gasification of the fuel, said hearth having a slag tap orifice for periodically discharging slag downwardly; a quenching chamber located below said slag tap orifice for quenching slag discharged through said slag tap orifice, said quenching chamber being constructed and arranged to hold a body of quenching liquid therein; a burner located within said quenching chamber for directing hot combustion products adjacent the underside of the slag top orifice to retain the slag and iron in the hearth; means for initiating the tapping of molten slag comprising means for stopping or reducing the burner output and means for reducing the pressure in the quenching chamber relative to that in the gasifier vessel; and an auxiliary burner assembly for freeing the slag tap orifice of a solidified plug of slag and iron, the improvement wherein said auxiliary burner assembly comprises: a substantially U-shaped member having passageways terminating externally of the quench chamber for connection to gas and air or oxygen supplies; a burner head mounted at the free end of one vertical limb member within the quench chamber and connected to the gas and air or oxygen supply passageways; bearing means carried by a wall of the quench chamber arranged to support the U-shaped member by its other vertical limb for rotational and vertical movements; and means for moving the member about said bearing means in said rotational and vertical directions whereby, in use of the gasifier, the burner can be selectively swung to and from a position directly beneath the slag tap orifice and moved to variable positions in vertical directions when it is in said position beneath the orifice.

4,073,628
CONTROL SYSTEM FOR APPARATUS TO GASIFY FINE-GRAIN FUELS IN A REACTOR

Paul Gernhardt, Bochum; Wolfgang Grams, Wanne-Eickel; Wilhelm Danguillier, and Siegfried Pohl, both of Bochum, all of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Filed Dec. 1, 1976, Ser. No. 746,245
Claims priority, application Germany, Dec. 18, 1975, 2556957
Int. Cl.[2] B01J *3/00*
U.S. Cl. 48—62 R **8 Claims**



1. In combination with an apparatus including a slag bath generator having a reactor for gasifying fine-grain fuel at an elevated pressure while maintaining a bath of liquid slag therein, a pressure vessel containing fine-grain fuel while fluidized with a vehicle gas for delivery into said reactor, and means for supplying a gasification agent into said reactor, a control system for controlling the introduction of the fluidized fine-grain fuel and the said gasification agent, said control system including the combination of:

load detecting means supporting said vessel in a manner for response to the weight of fine-grain fuel therein,

detector means to provide an electrical signal which varies in response to measurements by said load detecting means at predetermined time intervals during the feeding of fine-grain fuel from said pressure vessel into said reactor,

controller means producing the fuel rate control signal in response to a comparison between the electrical signal from said detector means and a predetermined reference value corresponding to a desired fuel supply ratio, and

control means responsive to said fuel rate control signal to adjust the supply of vehicle gas used for fluidized withdrawal and transfer of fuel from said pressure vessel for varying the rate of introduction of fluidized fine-grain fuel into said reactor.

4,073,629

COAL GASIFICATION PROCESS WITH IMPROVED PROCEDURE FOR CONTINUOUSLY DISCHARGING ASH PARTICLES AND APPARATUS THEREFOR

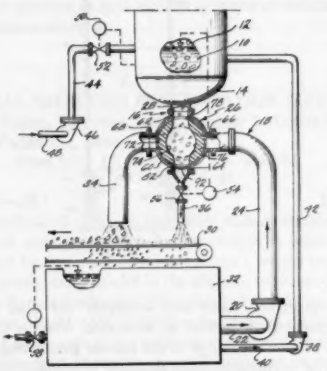
Erwin D. Funk, Glens Falls, N.Y., assignor to Kamyr Inc., Glens Falls, N.Y.

Continuation of Ser. No. 546,320, Feb. 3, 1975, abandoned, which is a continuation-in-part of Ser. No. 443,116, Feb. 15, 1974, abandoned. This application Oct. 26, 1976, Ser. No. 735,893

Claims priority, application South Africa, July 30, 1974, 74/4848

Int. Cl.² C10J 3/34

U.S. Cl. 48—77 **38 Claims**



1. A process of producing gas from gas producing material, such as coal, within gasifier means by continuously heating the material under pressure to produce gas and ash particles, and continuously discharging the ash particles from the gasifier means, the improvement wherein said continuous discharging comprises the steps of:

confining water within a first path including a volume having a free surface in communication with the gas pressure at the ash particle discharge end of the gasifier means,

substantially continuously discharging the ash particles into said volume of water through the free surface thereof,

maintaining a continuous flow of water along a second path at an energy level less than the energy level of the water in said first path and

continuously removing successive incremental volumes of ash particles entrained in water from communication with said first path and communicating said successive incremental volumes of water and entrained ash particles with the water flowing in said second path, said successive incremental volumes being removed from said first path by confining ash particles entrained in water to move into an incremental volume removal position within said first path, blocking the movement of the ash particles at said incremental volume removal position and successively removing an amount of blocked particles and the liquid entraining the same at the time of removal equal to said incremental volume.

17. Apparatus for producing gas from gas producing material, such as coal, comprising gasifier means for receiving a supply of gas producing material and continuously heating the same under pressure to produce gas and ash particles and means for continuously removing ash particles from said gasifier means under pressure, the improvement which comprises said ash removal means comprising:

means for confining water within a first path including a volume having a free surface in communication with the pressure within said gasifier means for receiving therein ash particles produced within said gasifier means by passage through said free surface,

means for maintaining a continuous flow of water along a second path at an energy level less than the energy level of the water in said first path, and

means for continuously removing from communication with said first path successive incremental volumes of ash particles entrained in water and continuously communicating said successive incremental volumes of ash particles and entrained water with the water flowing in said second path,

said means for continuously removing and communicating successive incremental volumes comprising a sluicing device comprising housing means having first path inlet means and second path inlet means and outlet means formed therein, a wheel rotatably mounted in said housing means having a plurality of separate pockets extending therethrough for alternately communicating with said first path inlet means and between said second path inlet means and outlet means during rotation thereof within said housing means.

4,073,630

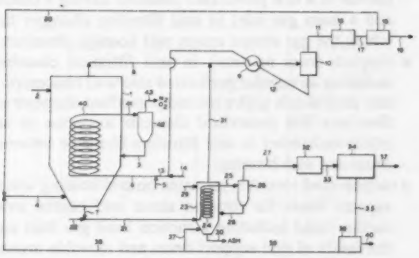
PRODUCTION OF CARBON MONOXIDE

Merritt V. DeLano, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 26, 1976, Ser. No. 735,362

Int. Cl.² C10J 3/06

U.S. Cl. 48—197 R **14 Claims**



1. A process for the production of carbon monoxide which comprises

a. reacting a first quantity of a solid carbon source in a first reaction zone with zinc oxide at a temperature of 910 ° to 1540 ° C. to produce a first volume of gas consisting essentially of zinc and carbon monoxide and a solids byproduct consisting essentially of ash having zinc values entrained therein,

b. separating zinc from said first volume of gas and recovering a carbon monoxide-containing gas as a product of the process,

c. passing said solids byproduct from said first reaction zone to an oxidation zone wherein said zinc values in said solids

byproduct are oxidized to zinc oxide, thereby forming a solid mixture consisting essentially of ash and zinc oxide,

d. reacting said solid mixture in a second reaction zone at a temperature of 910 ° to 1540 ° C. with a second quantity of a carbon source to produce a second volume of gas consisting essentially of zinc and carbon monoxide and withdrawing solids containing ash which is essentially free of zinc from the second reaction zone, and thereafter

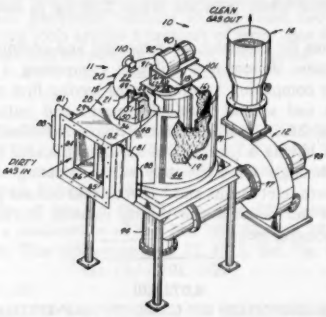
e. separating zinc from said second volume of gas and recovering a carbon monoxide-containing gas as a product of the process, and oxidizing the separated zinc to form zinc oxide which thereafter is recycled to said first reaction zone.

4,073,631

STATIONARY DRUM FILTRATION DEVICE AND METHOD

Jack D. Brady, Fayetteville, and Kenny M. Graves, Atlanta, both of Ga., assignors to Andersen 2000, Inc., Atlanta, Ga.

Filed Feb. 18, 1976, Ser. No. 658,992
Int. Cl.² B01D *46/02*
U.S. Cl. 55—97 **11 Claims**



1. A filtration device for removing particulate matter entrained in a gas stream comprising:

a housing defining a generally cylindrical filtration chamber therein of a first prescribed diameter having a central axis and a main gas inlet to said filtration chamber through which the gas stream enters said housing chamber;

a support drum mounted in said filtration chamber and including an annular perforated side wall concentric about said central axis with a second prescribed diameter smaller than said first prescribed diameter to define an annular inlet subchamber in said filtration chamber between said drum and said housing;

a suction head rotatably mounted on said housing within said support drum for rotation about said central axis, said suction head including a suction head gas inlet adjacent the inside of said support drum and movable around said drum as said suction head is rotated and including a suction head gas outlet about said central axis extending out of said housing, said suction head further including sealing means about said suction head gas inlet for forming a substantially gas tight seal between said suction head gas inlet and said perforated drum side wall as said suction head is rotated so that the gas stream entering said housing can only pass out of said housing through that portion of said perforated drum side wall in registration with said suction head gas inlet, said suction head gas inlet, and said suction head gas outlet;

filter media removably positioned on said perforated side wall of said support drum within said inlet subchamber so that the gas stream passing from said inlet subchamber into said suction head must pass through that portion of said filter media in registration with said suction head gas inlet; and,

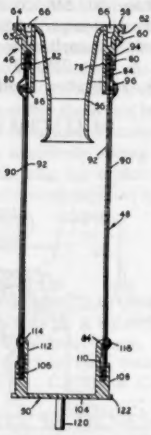
fan means operatively connected to said suction head gas outlet to cause the gas stream entering said main gas inlet to be drawn into said inlet subchamber, then through that portion of said filter media and said perforated side wall of said support drum aligned with said gas inlet to said suction head, then into said suction head gas inlet and finally out said suction head gas outlet whereby the particulate matter is separated from the gas stream by that portion of said filter media in registration with said suction head gas inlet.

4,073,632

FILTER BAG ASSEMBLY

Thomas V. Reinauer, Summit; Robert W. Duyckinck, New Providence, and Frank B. Handwork, Summit, all of N.J., assignors to United States Filter Corporation, New York, N.Y.

Filed July 7, 1975, Ser. No. 593,462
Int. Cl.² B01D *46/02*
U.S. Cl. 55—374 **15 Claims**



1. An improved filter bag assembly for dust collectors wherein particulate matter is separated from a carrier gas stream by selective passage of the carrier gas through an elongate tube of permeable filter medium terminally mounted in fluid communication with a receiving aperture in a gas impervious tube sheet separating the clean air and dirty air plenum chambers of said dust collector, said assembly comprising

a unitary mounting member of relatively rigid elastically deformable material adapted to be disposed within the receiving aperture in said gas impervious tube sheet and selectively shaped to define

a conduit portion for passage of the carrier gas therethrough and into said clean air plenum chamber

a tube sheet engaging portion disposed at one end of said conduit portion, and

a dependent skirt portion for supportively engaging the terminal end of the tube of filter medium suspended therefrom extending downwardly from the tube sheet engaging portion and disposed in spaced surrounding relation with said conduit portion within said dirty air plenum chamber

said tube sheet engaging portion including

an outwardly extending peripheral flange member disposed transverse to the longitudinal axis of said conduit portion and sized to overlie the marginal defining edge of said receiving aperture in the tube sheet, and

displaceable means disposed in adjacent spaced relation with said flange member and defining a transversely

disposed perimetric annular tube sheet receiving channel therebetween sized to closely accommodate the marginal defining edge of said receiving aperture in said tube sheet,

said dependent skirt portion including,

a first longitudinally extending dependent sleeve member,

a second longitudinally extending dependent sleeve member disposed in concentrically spaced surrounding relation with said first sleeve member and defining a longitudinally disposed filter medium receiving channel therebetween, and

a plurality of displaceable latching members dependent from said first sleeve member and having hook-like terminal end portions extending outwardly therefrom and disposed in the plane of said filter medium receiving channel,

an elongate filter medium retainer member sheathed by the tube of permeable filter medium disposed within said dirty air plenum chamber,

said filter medium sheathed retainer member having one terminal end portion thereof compressively disposed within said filter medium receiving channel in said mounting member and suspended therefrom by latching engagement of the hook-like terminal end portions of said latching members with said retainer member and a dependent end disposed remote therefrom, and

means closing the dependent end of said filter medium sheathed retainer member to limit the flow of the carrier gas from within said dirty air plenum inwardly through said filter medium and thence upwardly through said conduit portion of said mounting member into said clean air plenum chamber.

4,073,633

TOPICAL NITROGEN FERTILIZATION METHOD

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed May 17, 1976, Ser. No. 686,796
Int. Cl.² C05C *9/00*
U.S. Cl. 71—28 **10 Claims**

1. The method of topically fertilizing soils containing urease enzyme with urea particles under conditions in which a basic environment having a pH of at least about 7 would exist immediately adjacent said particles in the absence of the acid generator hereinafter defined, and minimizing the nitrogen lost by volatilization of said urea, including the steps of surface broadcasting said urea particles on said soil as a particle form combination of urea and at least one acid generator in an amount sufficient to maintain a pH below 7 in the soil immediately adjacent said urea particles, and maintaining (1) said particles on the surface of said soil, and (2) a pH below 7 in said soil immediately adjacent said particles for at least about 24 hours.

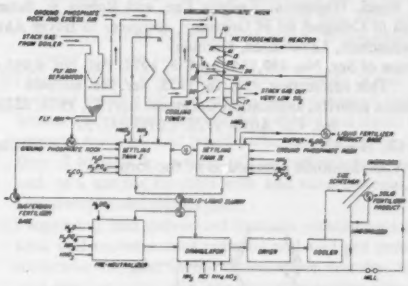
4,073,634

PROCESS FOR PRODUCTION OF FERTILIZERS

Ladislav J. Pircon, 305 Canterbury Lane, Oak Brook, Ill. 60521, and Ralph E. Peck, 3100 S. Michigan Ave., Chicago, Ill. 60616

Filed Apr. 16, 1976, Ser. No. 677,778
Int. Cl.² C05B *11/08*
U.S. Cl. 71—37 **10 Claims**

1. A process for the production of fertilizer and removal of sulfur oxides from stack gases comprising reacting sulfur oxide containing gas and water at a pH of 3 to 8 in a multiple state reactor to form sulfur containing acid, maintaining the pH of solution of said sulfur containing acid at 3 to 8 with a basic ion selected from the group consisting of calcium, ammonium and potassium ions, said calcium being derived from a salt selected from the group consisting of phosphatic and nitrogeneous salts to form a fertilizer selected from the group consisting of phosphatic, nitrogeneous and potassium fertilizers and combinations thereof, said basic ion being rendered water soluble by reaction with said sulfur containing acid at a pH of 2.5 to 4 and the solution increased to a pH of from 3 to 8 so as to facilitate the reaction of the sulfur oxide.



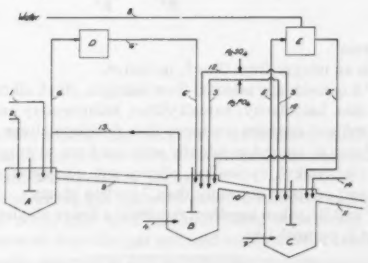
5. The process of claim 1 wherein said sulfur containing acid is mixed with concentrated acid selected from the group consisting of phosphoric and nitric acids and mixtures thereof.

4,073,635

PROCESS FOR PRODUCING A SLURRY SUITABLE FOR THE MANUFACTURE OF A MIXED FERTILIZER CONTAINING NITROGEN PLUS PHOSPHORUS

Pekka Ilkka Juhani Suppanen, Ruomela, Finland, assignor to Kemira Oy, Finland

Filed May 14, 1976, Ser. No. 686,536
Int. Cl.² C05B *13/02*
U.S. Cl. 71—34 **10 Claims**



1. A process for producing a slurry suitable for the manufacture of a mixed fertilizer containing nitrogen plus phosphorus from a crude phosphate which comprises bleaching with nitric acid to produce an acid slurry and neutralizing the acid slurry with ammonia under simultaneous cooling, in two stages in a first and a second neutralization zone, adding phosphoric acid to said acid slurry to reduce the amount crude phosphate required to satisfy the phosphorus requirement of the mixed fertilizer in an amount that at maximum 40% of the phosphoric acid is fed to the first neutralization stage in which the acidity of the slurry is maintained at a pH from 2.5 to 4.5 and adding the remainder of the phosphoric acid at a pH of 5 to 6 in the second neutralization stage.

4,073,636

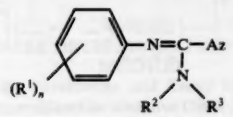
AZOLYLAMIDINE COMPOUNDS AND HERBICIDAL COMPOSITIONS

Erik Regel, Wuppertal; Ludwig Eue, and Robert R. Schmidt, both of Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 459,156, April 8, 1974, Pat. No. 3,993,469. This application Aug. 26, 1975, Ser. No. 607,986
Claims priority, application Germany, Apr. 27, 1973, 2321330
Int. Cl.[2] A01N *9/22*; C07D *231/12*
U.S. Cl. 71—92 23 Claims

1. Azolylamidine compound of the formula

(I)



wherein

n is an integer from 0 to 5, inclusive, R^1 is individually selected from halogen, alkyl, alkoxy, alkylthio, haloalkoxy, haloalkylthio, halophenoxy and haloalkyl and contains not more than 6 carbon atoms;

R^2 and R^3 are independently selected from hydrogen, alkyl, alkoxyalkyl, cycloalkyl, alkoxy and alkoxycarbonylalkyl and contains not more than 7 carbon atoms;

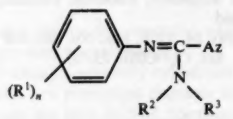
R^2 and R^3, taken together, represent a lower alkylene bridge;

Az is pyrazol-1-yl.

20. Herbicidal composition comprising herbicidally acceptable carrier and, in effective amounts, an azolylamidine compound as claimed in claim 1.

21. Method of combatting undesired vegetation, which method comprises applying to said vegetation or its habitat a herbicidally effective amount of an azolylamidine compound of the formula

(I)



wherein

n is an integer from 0 to 5, inclusive,

R^1 is individually selected from halogen, alkyl, alkoxy, alkylthio, haloalkoxy, haloalkylthio, halophenoxy and haloalkyl and contains not more than 6 carbon atoms;

R^2 and R^3 are independently selected from hydrogen, alkyl, alkoxyalkyl, cycloalkyl, alkoxy and alkoxycarbonylalkyl and contains not more than 7 carbon atoms;

R^2 and R^3, taken together, represent a lower alkylene bridge;

Az is pyrazol-1-yl.

4,073,637

CYCLOHEXIMIDE-IMIDE OR CARBAMATE COMBINATIONS AS FRUIT ABSCISSION AGENTS

Robert E. Holm, and Robert D. Battershell, both of Painesville, Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Aug. 11, 1975, Ser. No. 603,289
Int. Cl.[2] A01N *9/22*
U.S. Cl. 71—94 3 Claims

1. A composition capable of promoting fruit abscission, which composition consists essentially of cycloheximide and N-[(trichloromethyl)thio] phthalimide wherein the amount of said cycloheximide in said composition is not in excess of about 20 ppm.

4,073,638

WOODY STEMMED PLANT GROWTH STIMULATION

Robert R. MacMurray, 550 E. Third St., Bloomsburg, Pa. 17815

Continuation-in-part of Ser. No. 526,819, Nov. 25, 1974, Pat. No. 3,967,953, which is a continuation-in-part of Ser. No. 186,508, Oct. 4, 1971, Pat. No. 3,861,801, which is a continuation-in-part of Ser. No. 815,493, April 11, 1969, Pat. No. 3,697,253. This application Apr. 22, 1976, Ser. No. 679,208
Int. Cl.[2] A01N *9/20*
U.S. Cl. 71—100 4 Claims

1. A method of stimulating the growth of woody stemmed plants comprising applying to the foliage and stems thereof a composition including S-ethyl-N,N-dipropylthiocarbamate and N,N-di-n-propyl-4-trifluoromethyl-2,6-dinitroaniline as the active ingredients, the combined concentrations and amounts of both compounds being sufficient to effect growth stimulation.

4,073,639

METALLIC FILLER MATERIAL

David S. Duvall, Cobalt; William A. Owczarski, Cheshire; Daniel F. Paulonis, Moodus, and Robert P. Schaefer, East Hartford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 538,618, Jan. 6, 1975, Pat. No. 4,008,884. This application Nov. 24, 1976, Ser. No. 744,539
Int. Cl.[2] B23K *35/22*
U.S. Cl. 75—.5 R 7 Claims

1. A metallic filler material mix for filling cavities in and between metal articles which comprise:

a first, finely-divided homogeneous particulate component substantially corresponding in composition to that of the metal articles;

a second, finely-divided homogeneous particulate component having as its basis the same basis metal as that of the articles and containing a melting point depressent such as boron in a quantity substantially exceeding that present in the metal articles;

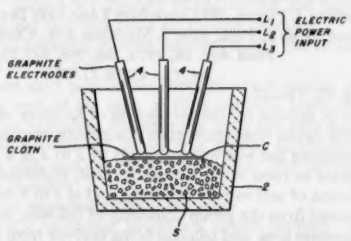
the first and second particulate components being intimately blended to form a powder mix which has an overall composition approximating that of the metal articles, a portion of the mix exhibiting a capability of forming a liquid phase while another portion of the mix remains unliquefied at a processing temperature below the melting point of the articles, the mix being characterized by isothermal resolidification at the processing temperature.

4,073,640

METHOD OF MELTING SLAG

Ferhun H. Soykan, New Hartford, N.Y., assignor to Special Metals Corporation, New Hartford, N.Y.

Filed Mar. 9, 1977, Ser. No. 775,827
Int. Cl.[2] C22B *4/00*; C21C *5/52*
U.S. Cl. 75—10 R 6 Claims



1. The method of melting slag which is not electrically conductive at ambient temperatures which comprises charging a crucible with solid slag, placing on top of said charge a sheet-like covering of an electrically conductive material

which sublimes without melting, contacting said covering material with at least two electrodes in spaced apart relationship with the covering providing a good electrical path between electrodes, supplying electric power to said electrodes to cause said covering material to sublime and set a plasma arc between said electrodes to start melting of the scrap, and continuing application of said electric power after initial melting of the slag with current passing through the slag between electrodes to melt said slag in said crucible.

4,073,641
SELECTIVE REDUCTION OF NICKEL ORE WITH A LOW NICKEL CONTENT

Jean Montanteme, Aiguebelle; André Greffe, and François Grandjacques, both of Annecy, all of France, assignors to Societe Francaise d'Electrometallurique, Paris, France

Continuation-in-part of Ser. No. 545,081, Jan. 29, 1975, abandoned. This application Mar. 7, 1977, Ser. No. 774,976
Claims priority, application France, Feb. 21, 1974, 74 05879
Int. Cl.² C21C *5/52*
U.S. Cl. 75—11 **2 Claims**

1. In a process for the selective reduction of oxidized metallic ore or slag containing a number of other metallic oxides and having a nickel oxide content in the order of about 2 to 3% in order to selectively extract from the ore or slag a substantial portion of the nickel present to the general exclusion of the other metallic oxides by admixture of a reducer and the ore or slag to be reduced to form a reaction charge, followed by subjecting the charge to pyrometallurgical reduction and fusion for recovery of the nickel as a nickel rich ferro-nickel alloy the improvement comprising preparing the reaction charge and recovering the ferro-nickel alloy as a melt by the sequential steps of:

a) calculating the substantially precise amount of carbonaceous reducer necessary to reduce only the totality of the reducible nickel present in the ore or slag to limit the reduction of other metallic oxides;
b) calculating the volume of the ore to be reduced;
c) mixing said reducer with a carrier to provide a reducing mass such that the volume of the ore to be reduced will not exceed about three times the volume of the reducing mass;
d) intimately admixing the reducing mass with the ore or slag to provide the reaction charge;
e) subjecting the reaction charge to the pyrometallurgical reduction and fusion by beginning reduction in a rotary furnace and completing reduction in an arc furnace to provide a liquid metal and slag fusion product; and
f) recovering the ferro-nickel melt from the fusion product.

4,073,642
METHOD FOR REDUCING MATERIAL CONTAINING IRON OXIDES

Per Harald Collin, Falun; Sune Natanael Flink; Bjorn Widell, both of Vasteras, all of Sweden; Martin Hirsch, Frankfurt am Main, and Lothar Reh, Bergen-Enkheim, both of Germany, assignors to Stora Kopparbergs Bergslags Aktiebolag, Falun, Sweden

Filed Sept. 4, 1975, Ser. No. 610,391
Int. Cl.² C21B *13/02*
U.S. Cl. 75—35 **12 Claims**

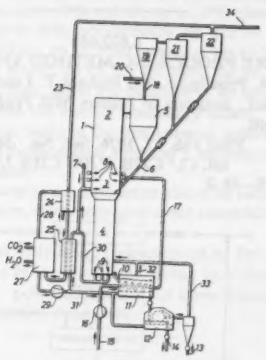
1. A method of reducing a pulverized material containing iron oxides mixed with carbonaceous material, comprising:

(a) maintaining in a vertically uninterrupted, elongated reaction zone a circulating fluidized bed, said circulating fluid bed being maintained by
1) continually withdrawing a portion of fluidized solids and fluidizing gas and a gas formed by reaction in said reaction zone,
2) separating said gas and solids,
3) continually returning a portion of said solid material to said reaction zone for circulating of said solids in said bed without a solid gas interface in said bed, and
4) continually returning said separation gas to said elongated reaction zone as a fluidizing gas, said reaction zone consisting essentially of lower, intermediate, and upper reaction zones;

(b) supplying said bed with a suitable quantity of pulverized material containing iron oxides and pulverized solid carbonaceous material as said solid material and liquid carbonaceous material, said liquid carbonaceous material being from 0 to 60% by weight of the carbonaceous material and, as a gas for reaction with said solid material, a gas containing molecular oxygen;

(c) supplying said pulverized material containing iron oxides, said carbonaceous material and said gas containing molecular oxygen, to the intermediate reaction zone of said reaction zone, said intermediate reaction zone being at a position of about middle of said elongated reaction zone;

(d) controlling the carbonaceous material feed into said reaction zone so that there is always sufficient solid carbonaceous material in the bed to prevent the defluidization of said bed caused by sticking;



(e) withdrawing gas and solid material from the upper reaction zone, said solid material being withdrawn, being separated from the gas and said solid material being continually returned to said intermediate reaction zone of said reaction zone;

(f) feeding a portion of said withdrawn gas, after dust separation and elimination of substantially all carbon dioxide and water, to said lower part of said reaction zone as fluidizing and reducing gas, said carbon dioxide being formed by reaction of carbon in said carbonaceous material with oxygen in said ore or molecular oxygen in said molecular oxygen containing gas and said water being formed by reaction of hydrogen from said carbonaceous material with oxygen in said ore or molecular oxygen in said molecular oxygen containing gas; and

(g) withdrawing a solid material containing completely or partially reduced iron oxides from the lower part of the reaction zone.

4,073,643

CONTINUOUSLY CAST STEEL SLABS FOR STEEL SHEETS HAVING EXCELLENT WORKABILITIES AND METHOD FOR PRODUCTION THEREOF

Ko Kumai; Koichi Asano, and Hideharu Bando, all of Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 627,869, Oct. 31, 1975, abandoned, which is a continuation of Ser. No. 472,358, May 22, 1974, abandoned. This application July 7, 1976, Ser. No. 703,218

Int. Cl.[2] C21C *7/10*

U.S. Cl. 75—49 2 Claims

1. A method for producing a continuously cast steel slab for use in manufacturing steel sheets having excellent workabilities which comprises blowing molten steel to a total oxygen content between 600 ppm and 1600 ppm and a silicon content less than 0.02% with a carbon content not more than 0.10%, tapping the molten steel into a ladle, vacuum degassing the molten steel to effect decarburization and deoxidation together with deoxidation adjustment with a material selected from the group consisting of Al and a mixture of Al and Ti to obtain a molten steel containing not more than 0.02% of carbon, less than 0.02% of Si, not more than 0.6% of manganese, not more than 0.005% of sol. aluminum, not more than 0.005% of titanium, not more than 150 ppm of free oxygen with a reduced content of silica inclusions, continuously casting the molten steel and then cold reducing the cast steel at a reduction of not less than 60% to obtain a silicon inclusion clearness of $d_{60} \times 400 \leqq 0.01\%$.

4,073,644

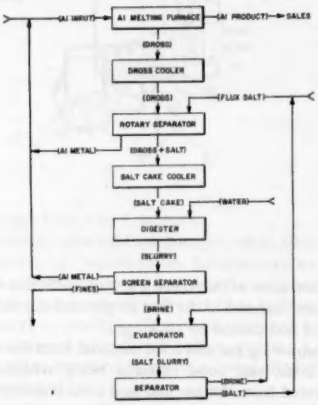
SALT CAKE PROCESSING METHOD AND APPARATUS

Pandelis N. Papafingos, and Richard T. Lance, both of Riverside, Calif., assignors to Alumax Mill Products, Inc., Riverside, Calif.

Filed Feb. 17, 1976, Ser. No. 658,430

Int. Cl.[2] C22B *21/00;* C21B *3/04*

U.S. Cl. 75—68 R 11 Claims



1. The improved method of recovering metallic values from dross and recovering fluxing salts used in the recovery of such metallic values comprising the steps of:

Step 1: removing dross from the melt and cooling the dross to retain in the dross metallic aluminum entrained therein;

Step 2: heating the dross under a cover of flux salts comprised of chloride salts of metals selected from the group consisting of alkali, alkaline earth metals and mixtures of the same to a temperature above the melting point of aluminum;

Step 3: removing molten aluminum from the dross leaving a flux-dross mixture having entrained therein residual aluminum metal;

Step 4: cooling the flux-dross mixture to form a salt cake product comprising pieces of salt cake having an average size of less than about 1 inch in thickness and about 100 square inches in area;

Step 5: digesting said salt cake product by heating and agitating the same in water to thereby dissolve the salt therein to form a brine slurry of the salt in solution and the insoluble constituents of the dross;

Step 6: separating the brine slurry into at least one cut consisting substantially of larger chunks of metal and dross having an average minor diameter of greater than about 250 microns and a final cut consisting essentially of a slurry of brine and particles having an average minor diameter of less than about 700 microns;

Step 7: separating from the slurry of Step 6 substantially all particles of dross and washing the same to produce a by-product consisting essentially of particles of aluminum oxide and aluminum metal having an average particle size of less than about 700 microns;

Step 8: evaporating a portion of the brine remaining after the separation of Step 7 to thereby cause crystallization of a portion of the salt dissolved therein and form a salt crystal-brine slurry and

Step 9: separating crystallized salt from the crystal-brine slurry of Step 8 to produce a flux salt product suitable for recycling as part of the flux salts of Step 2 and returning the brine remaining from the separation for further evaporation in Step 8.

4,073,645

PROCESS OF SMELTING SULPHIDIC COPPER ORE CONCENTRATES

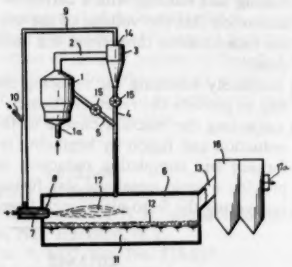
Walter Fritsch, Bergisch-Gladbach, and Gerhard Melcher, Cologne, both of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed Apr. 9, 1976, Ser. No. 675,629

Claims priority, application Germany, Apr. 9, 1975, 2515464

Int. Cl.[2] C22B *15/00*

U.S. Cl. 75—74 5 Claims



1. A process of smelting a sulphidic copper ore concentrate comprising the steps:

introducing and partially roasting the sulphidic copper ore concentrate in a whirling layer roasting furnace independently from a subsequent smelting operation in a reverberatory smelting furnace;

separating hot roasting gases derived from the partially roasted ore concentrate in the whirling layer roasting furnace;

mixing the separated roasting gases with enrichment oxygen;

joining and mixing into a smelting flame a combustible gaseous fuel and the oxygen enriched separated hot roasting gases;

directing the smelting flame from one side of the reverberatory smelting furnace into a heating zone over the top of a copper matte within the reverberatory smelting furnace;

continuously passing the partially roasted concentrate from the roasting furnace into and through said heating zone

above said copper matte in the reverberatory smelting furnace;

in the heating zone effecting smelting of the partially roasted ore concentrate and heating of the copper matte by the heat from said flame;

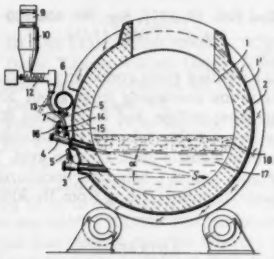
generating in said heating zone by virtue of said flame an oxidizing atmosphere of such high temperature and oxygen content that sulphur from the molten sulphidic copper is converted into an exhaust gas of high SO_2 content;

and exhausting the exhaust gas from the opposite side of the reverberatory smelting furnace.

4,073,646
METHOD FOR THE THERMAL REFINEMENT OF GREATLY CONTAMINATED COPPER IN MOLTEN PHASE

Alfred Kryczun, and Gerhard Melcher, both of Cologne, Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed May 13, 1976, Ser. No. 685,987
Claims priority, application Germany, May 16, 1975, 2521830
Int. Cl.² C22B *15/00*
U.S. Cl. 75—76 **6 Claims**



1. In a method for the thermal refinement of contaminated copper scrap in the molten phase in which superimposed molten phases are formed in a treating vessel, the lower phase containing black copper and the upper phase containing a slag with impurities such as zinc, tin, lead and the like, the improvement which comprises simultaneously injecting a reducing gas into said upper phase from a plurality of spaced parallel points and an oxidizing gas into said lower phase from a plurality of spaced parallel points, said oxidizing gas being introduced at a rate higher than said reducing gas.

4,073,647
PREPARATION OF CERMETS

Chester S. Morgan, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 26, 1976, Ser. No. 680,606
Int. Cl.² B22F *1/04*
U.S. Cl. 75—235 **1 Claim**

1. A cermet neutron absorber containing 2–20 volumepercent metal present as a continuous phase throughout the volume of said neutron absorber, said neutron absorber produced by the process comprising the steps of:

mixing a europium sesquioxide powder and an elemental metal precursor compound to form a solid phase mixture, said elemental metal selected from the group of tantalum, rhenium, tungsten and molybdenum;

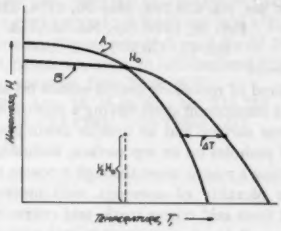
decomposing said elemental metal precursor compound within said mixture so as to provide a second mixture comprising said europium sesquioxide powder and said elemental metal in an uncombined state; and

densifying said second mixture to provide a cermet neutron absorber having elemental metal present as a continuous phase.

4,073,648
THERMOPLASTIC PREALLOYED POWDER

Timothy Earl Volin, Tuxedo; John Stanwood Benjamin, Suffern; Jay Michael Larson, Warwick, and Robert Lacock Cairns, Suffern, all of N.Y., assignors to The International Nickel Company, Inc., New York, N.Y.

Division of Ser. No. 477,596, June 10, 1974, Pat. No. 3,930,841, which is a division of Ser. No. 316,077, Dec. 18, 1972, Pat. No. 3,865,575. This application Sept. 4, 1975, Ser. No. 610,132
Int. Cl.² B22F *1/04*
U.S. Cl. 75—245 **8 Claims**



1. As a new article of manufacture, a solid metal body formed from superalloy prealloyed powder containing from up to 60% chromium, up to 30% cobalt, up to 10% aluminum, up to 8% titanium, up to 30% molybdenum, up to 25% tungsten, up to 10% columbium, up to 10% tantalum, up to 7% zirconium, up to 0.5% boron, up to 5% hafnium, up to 2% vanadium, up to 6% copper, up to 5% manganese, up to 70% iron, up to 4% silicon and the balance essentially nickel,

a. the said powder being in the strain energy induced condition with a Thermoplastic Physical Characteristic of at least TPC-1, and

b. hot consolidated at a temperature above its recrystallization temperature, to thereby give a hot consolidated solid metal body,

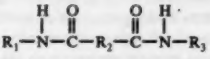
c. the solid metal body being characterized by fine grains as a consequence of strain energy having been imparted to the superalloy powder prior to hot consolidating above the recrystallization temperature.

4,073,649
DICARBOXYLIC ACID BIS-AMIDES IN IMPROVED IMAGING PROCESS

Charles G. Scouten, Webster, N.Y., and Willard C. Hamilton, Morganville, N.J., assignors to Xerox Corporation, Stamford, Conn.

Filed June 3, 1976, Ser. No. 692,258
Int. Cl.² G03G *9/02*
U.S. Cl. 96—1.4 **17 Claims**

1. In an imaging process comprising the steps of forming a latent image on an imaging surface, developing said latent image by bringing a developing material within the influence of said latent image to form a powder image corresponding to said latent image, and removing at least a portion of at least any residual developed image from said imaging surface; the improvement comprising treating said imaging surface with an effective amount of a deposit forming material comprising amides of the structure



where R_1 and R_3 are H, phenyl, lower alkyl substituted phenyl, or lower alkyl groups, where lower alkyl includes groups having from 1 to about 7 carbon atoms in a branched, unbranched, or cyclic configuration, and where R_2 is an alkylene group of 2 to about 22 carbon atoms, phenylene, naphthylene, and phenylene and naphthylene groups bearing lower alkyl

substituents of 1 to about 7 carbon atoms in either straight, branched, or cyclic chain configuration.

4,073,650

METHOD OF RECORDING ON A MICROFICHE

George J. Yevick, Leonia, N.J., assignor to IZON Corporation, Stamford, Conn.

Division of Ser. No. 474,795, May 30, 1974. This application Feb. 26, 1976, Ser. No. 661,762
Int. Cl.[2] G03C *11/00, 5/00*
U.S. Cl. 96—46 5 Claims

1. A method of recording macro scenes on an optical fiche defined by a transparent sheet having a photographic emulsion on its bottom surface and an opaque coating apertured by a plurality of pinholes on its top surface, including the steps of:

a. projecting a macro scene through a coarse mask provided with a plurality of openings, said macro scene being spaced from said coarse mask, said coarse mask openings being parallel and contiguous to said pinholes,

b. aligning the coarse mask openings with a unique set of pinholes carried by the fiche, the number of coarse mask apertures being less than the number of pinholes, each coarse mask aperture being in a cell defined by opaque septa to thereby prevent optical cross-talk between the pinholes of different sets,

c. whereby disposed micro images of the projected macro scene are formed on the emulsion.

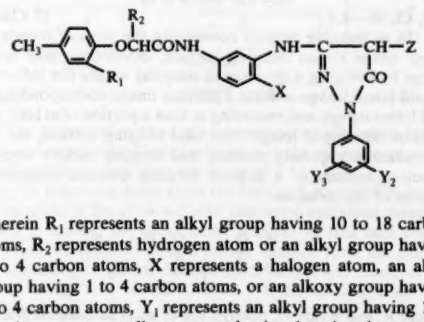
4,073,651

IMAGE-FORMING LAYER CONTAINING SILVER HALIDE EMULSION AND MAGENTA COUPLER

Shoji Yamada; Akira Tanaka; Shoichi Horii, and Kiyoshi Yamashita, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Apr. 21, 1976, Ser. No. 679,083
Claims priority, application Japan, Apr. 28, 1975, 50-51907
Int. Cl.[2] G03C *1/40*
U.S. Cl. 96—100 R 10 Claims

1. An image-forming layer containing silver halide emulsion and a magenta coupler 1-aryl-3-anilino-5-pyrazolones represented by the general formula:



wherein R_1 represents an alkyl group having 10 to 18 carbon atoms, R_2 represents hydrogen atom or an alkyl group having 1 to 4 carbon atoms, X represents a halogen atom, an alkyl group having 1 to 4 carbon atoms, or an alkoxy group having 1 to 4 carbon atoms, Y_1 represents an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, or a halogen atom, Y_2 and Y_3, which may be the same or different, represent hydrogen atoms or have the meaning assigned to Y_1, and Z represents hydrogen atom or the atom or group which splits off by coupling.

4,073,652

DIRECT-POSITIVE SILVER HALIDE EMULSIONS

Raymond Leopold Florens, Edegem, Belgium, assignor to AFGA-Gevaert N.V., Mortsel, Belgium

Filed Aug. 26, 1975, Ser. No. 607,909
Claims priority, application United Kingdom, Sept. 30, 1974, 42459/74
Int. Cl.[2] G03C *1/30, 1/28*
U.S. Cl. 96—101 18 Claims

1. A direct-positive photographic element comprising a support and at least one silver halide emulsion layer with reduction and gold-fogged silver halide grains, characterized in that before development a sulphite selected from the group consisting of ammonium sulphite or an alkali metal sulphite and a gold compound have been added to the fogged silver halide emulsion in an amount sufficient to stabilize the D_{max} of the silver image to be formed.

4,073,653

PRINTING PASTE COMPOSITIONS CONTAINING SODIUM CELLULOSE SULFATE, AND PROCESSES THEREFOR

Thomas A. Lindroth, Spring Valley, and Joseph S. Racciato, San Diego, both of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 10, 1976, Ser. No. 656,920
Int. Cl.[2] C09D *11/14*
U.S. Cl. 106—26 17 Claims

1. An aqueous printing paste containing an acid dye and a thickener composition containing from about 10% to about 60% sodium cellulose sulfate, and from about 90% to about 40% of at least one member selected from locust bean gum, guar gum, a soluble alginate gum, xanthan gum, S-10 heteropolysaccharide gum and S-7 heteropolysaccharide gum, the amount of alginate, if present, being from 10-30%.

4,073,654

OPTICAL ARTICLES PREPARED FROM HYDRATED GLASSES

Che-Kuang Wu, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Dec. 15, 1975, Ser. No. 640,733
Int. Cl.[2] C03C *3/10, 3/04*
U.S. Cl. 106—52 12 Claims

1. A molded glass article comprising a hydrated base glass body having a total water content ranging from about 0.5 to 10% by weight, the base glass constituents comprising in mole % on an oxide basis, 72–82% SiO_2, 10–17% Na_2O and/or K_2O, and 5 to 15% of a member selected from ZnO, PbO, and mixtures thereof; the water content consisting of silanol groups and molecular water in such proportion that the ratio of silanol groups to molecular water is equal to or greater than 1.0; and at least one portion of the article having an optical quality surface such that over a surface distance of at least 0.1 inch, on an arithmetic average basis, the Roughness Height is less than about 3.0 microinches.

4,073,655

GLASSES, THERMALLY STABLE HIGH (BETA)-CRISTOBALITE GLASS-CERAMICS AND METHOD

Chi-Tang Li, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 734,911, Oct. 22, 1976, which is a continuation-in-part of Ser. No. 320,788, Jan. 3, 1973, abandoned. This application Apr. 4, 1977, Ser. No. 784,209
Int. Cl.[2] C03C *3/04, 3/10, 3/22*
U.S. Cl. 106—52 13 Claims

1. A glass crystallizable to a glass-ceramic having stabilized high-cristobalite solid solution crystal phase formed by thermal in situ crystallization, said glass consisting essentially of the composition $MO{\cdot}Al_2O_3{\cdot}nSiO_2$ wherein the (Al_2O_3/MO) molar

ratio is 1 and MO is a member of the group consisting of CaO and a mixture of CaO and a metal oxide wherein the metal is a cation selected from iron and the first, second and fourth groups of the Periodic Table and the molar ratio of CaO to said metal oxide is from 4:1 to 1:3 and *n* is a positive number of from 8 to 37.

4,073,656

FIRED REFRACTORY BRICK AND PROCESS FOR PREPARING THE SAME

Hans-Jurgen Gulas, and Helmut Neuper, both of Leoben, Austria, assignors to Veitscher Magnesitwerke-Actien-Gesellschaft, Vienna, Austria

Filed Oct. 14, 1976, Ser. No. 732,452

Claims priority, application Austria, Oct. 20, 1975, 7955/75

Int. Cl.² C04B *35/48*

U.S. Cl. 106—57 **4 Claims**

1. A fired refractory brick composed of magnesia, 2 to 10% alumina, calcium oxide and up to 1.5% silica, the weight ratio of calcium oxide to silica being more than 1.4 and 2.2 (CaO - 1.4 SiO_2)% to 5.5% zirconia, calculated on an ignition loss free basis, calcium oxide and zirconia forming a calcium zirconate phase in the brick and the content of the calcium zirconate phase being from 0.5 to 8%, all percentages being by weight.

4,073,657

GLASS FOR SEMICONDUCTORS

Earl Klimer Davis, Tempe; William Oakley Rogers, Mesa, and Duane Charles Silvis, Scottsdale, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed July 16, 1976, Ser. No. 705,968

Int. Cl.² C03C *3/04, 3/10;* A01L *3/00*

U.S. Cl. 106—73.5 **1 Claim**

1. An insulating and passivating glass and zircon composition consisting of 36 to 40 volume percent of zircon of maximum particle size up to 5 microns and the balance a base glass of particle size less than 44 microns wherein said base glass consists of 3 percent-SiO_2, 73 percent-PbO, 6 percent-ZnO, 3 percent-BaO, 2 percent-CdO, 1 percent-TiO_2 and 12 percent-B_2O_3.

4,073,658

HYDRAULIC CEMENT COMPOSITION

Naoteru Ohtani, Wakayama; Tutomu Koyama, Kainan; Takashi Takeuchi, Wakayama; Toshihiro Azuma, Wakayama, and Morio Matsuda, Wakayama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Jan. 26, 1977, Ser. No. 762,759

Claims priority, application Japan, Mar. 10, 1976, 51-25883

Int. Cl.² C04B *7/352, 7/353*

U.S. Cl. 106—92 **3 Claims**

1. A hydraulic cement composition comprising hydraulic cement, water and, optionally, aggregate, said composition containing from 0.01 to 0.3 weight percent, based on the weight of said hydraulic cement, of a hydrogenated oligosaccharide having an average molecular weight of from 300 to 3500, wherein the hydrogenation has transformed the terminal aldehyde groups of the oligosaccharide to hydroxyl groups.

4,073,659

ASPHALT-GILSONITE EMULSION

Michael V. Burris, 3004 Campbell Circle, Las Vegas, Nev. 89107

Continuation-in-part of Ser. No. 686,733, May 17, 1976. This application Sept. 27, 1976, Ser. No. 726,945

Int. Cl.² C08L *95/00;* C09D *3/24*

U.S. Cl. 106—277 **7 Claims**

1. An asphalt emulsion composition comprising:

an asphalt phase of between about 10% and about 33% by weight gilsonite and between about 66 and about 90% by weight penetration grade asphalt having a penetration below 100 dmm at 77° F,

between about 0.1 and about 2% of a cationic emulsifying agent, and water, the ratio of asphalt phase:water being between about 1:1 and 2:1 by weight, respectively, prepared by a method comprising melting the gilsonite at a temperature of at least about 300° F, independently heating asphalt to a temperature of at least about 300° F, mixing the gilsonite and asphalt while maintaining a mixture temperature of at least 300° F, and thereafter blending asphalt-gilsonite mixture with water and emulsfying agent.

4,073,660

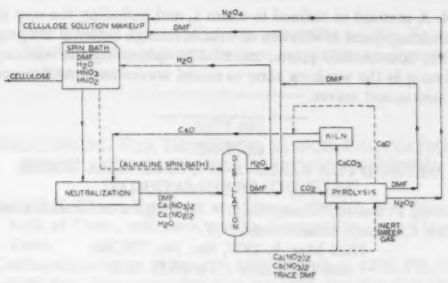
RECOVERY OF CHEMICAL COMPONENTS OF CELLULOSIC REGENERATING SOLUTION

Norman A. Portnoy, Hopatcong, N.J., and David Paul Anderson, Amherst, Mass., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 18, 1976, Ser. No. 715,223

Int. Cl.² C08K *5/20;* C08B *3/32*

U.S. Cl. 106—311 **16 Claims**



1. A process for the recovery of the chemical components of a cellulosic regenerating solution containing a dialkylacylamide solvent, a regenerant and the metal salts of nitrous and nitric acid comprising

distilling the solution to remove and recover the dialkylacylamide solvent, and

pyrolyzing the metal salts at a temperature of at least 600° C. in the presence of oxygen while passing a sweep gas over said salts to remove and recover nitrogen dioxide gas evolving from said pyrolysis reaction.

4,073,661

PROCESS FOR CLEANING COMMINUTED PLASTIC MATERIAL

Heinrich Buzga, Grevenbroich; Werner Steprath, Dormagen, and Kurt Pause, Bosau uber Eutin, all of Germany, assignors to Maschinenfabrik Buckau R. Wolf Aktiengesellschaft, Grevenbroich, Germany

Filed June 10, 1976, Ser. No. 694,550

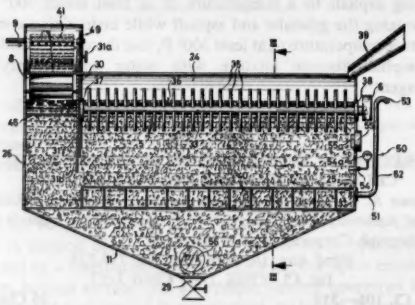
Claims priority, application Germany, June 10, 1975, 2525750; June 10, 1975, 2525749

Int. Cl.² B08B *3/12*

U.S. Cl. 134—1 **10 Claims**

1. A continuous method for preparing and cleaning grossly soiled products of plastic material, such as sheets, bands, sacks or the like for subsequent re-use, comprising the steps of comminuting the plastic material after removing rough foreign objects therefrom; feeding the comminuted plastic material into a washing solution having a greater specific weight than the plastic material; subjecting the washing solution and the comminuted plastic material therein in a washing zone to turbulence; advancing the comminuted plastic material into a turbulence-free zone containing washing solution and located downstream of the washing zone by transferring the plastic material under a submerged edge of a partition which is submerged in the washing solution and separates the washing zone from the turbulence-free zone; continuously removing the

comminuted plastic material from the turbulence-free zone; and thereafter mechanically pre-drying and subsequently thermally finish drying the comminuted plastic material.



4. A method as defined in claim 1, and including the step of increasing speed of solution of soluble foreign material clinging to the comminuted plastic material by subjecting the washing solution in the washing zone to sound waves and interference of said sound waves.

4,073,662
METHOD FOR REMOVING A MAGNESIA DOPED ALUMINA CORE MATERIAL

Marcus P. Borom, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 9, 1977, Ser. No. 775,761
Int. Cl.² C23G 1/14; C01F 7/00
U.S. Cl. 134—2 **6 Claims**

1. A method for removing a ceramic core material comprising magnesia doped alumina disposed in an abutting relationship of a casting of an advanced superalloy material, wherein the composition of the ceramic material includes a magnesia content of greater than about 1 mole percent but no greater than about 20 mole percent, balance alumina, and the microstructure of the magnesia doped alumina is characterized by a matrix comprising an interconnecting network of magnesia doped alumina defining a plurality of interstices in which the material magnesium aluminate spinel is deposited, comprising the process steps of

(a) placing the casting and the ceramic core material in an autoclave containing a leaching solution selected from the group consisting of a solution of NaOH and a solution of KOH said leaching solution being from about 10 percent by weight to about 70 weight hydroxide and the balance water;

(b) heating the casting, ceramic core material and leaching solution to a temperature of at least about 200° C;

(c) dissolving substantially all of the magnesia doped alumina interconnecting network in the ceramic core material by chemical attack by the leaching solution, and

(d) removing at least some of the undissolved ceramic core material from the casting by the solution agitated by the chemical reaction.

4,073,663
METHOD AND APPARATUS FOR AUTOMATIC BACTERIOLOGICAL CLEANING AND DISINFECTION OF OBJECTS

Ernst Harry Lundgren, Norra Grangesbergsgatan 11, S-214 50 Malmo, Sweden

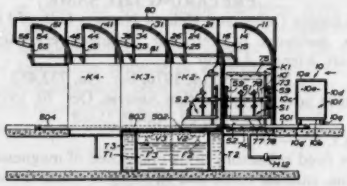
Filed May 20, 1976, Ser. No. 688,360
Claims priority, application Sweden, May 20, 1975, 7505691
Int. Cl.² B08B 3/02
U.S. Cl. 134—10 **11 Claims**

1. In a method for automatic bacteriological cleaning and disinfecting of objects by sequential treatment of the objects in separate liquid-tight compartments, the sequential steps comprising:

a. pumping treating liquid from a first tank to contact objects in the first of a series of the liquid-tight compartments and then discharging the liquid so pumped;

b. moving the objects from the first of said compartments to an intermediate liquid-tight compartment;

c. supplying fresh treating liquid to a second tank;



d. pumping the fresh treating liquid from the second tank to contact objects moved from the first of the series of liquid-tight compartments into the intermediate liquid-tight compartment and then discharging the liquid so pumped directly to the first tank;

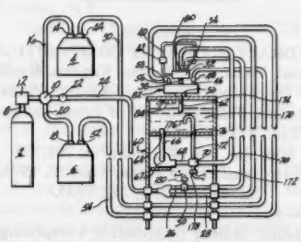
e. moving the objects from an intermediate liquid-tight compartment into a final liquid-tight compartment; and

f. drying the objects in the final liquid-tight compartment.

4,073,664
AUTOMATICALLY CONTROLLED CLEANING FLUID CIRCUIT FOR A FOAM GENERATING APPARATUS AND METHOD

John F. Zwirlein, New Haven, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 656,157, Feb. 9, 1976. This application July 1, 1976, Ser. No. 701,703
Int. Cl.² B08B 7/04
U.S. Cl. 134—18 **29 Claims**



12. A method of automatically cleaning the mixing chamber of a foam generating apparatus, said apparatus being of the type wherein at least two inter-reactive materials are mixed and foam generated and including a foam gun head having a mixing chamber, solvent storage means for storing a solvent, and means for supplying solvent to the mixing chamber when an electrically actuated solvent valve is in a first position and for by-passing said mixing chamber and returning said solvent to said storage means when said valve is in a second position said method comprising:

a. electrically sensing the presence of the foam gun head when the foam gun head is in a first position to discharge solvent from the mixing chamber into the solvent storage means,

b. electrically actuating said solvent valve to move said valve to its first position in response to the sensing of the foam gun head in said first position, and

c. electrically actuating said solvent valve to move said valve to the second position in response to the electrical

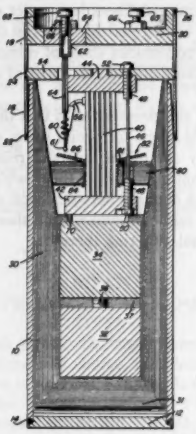
sensing of the removal of said foam gun head from its first position.

4,073,665

MICROWATT THERMOELECTRIC GENERATOR

Harold N. Barr, Baltimore, Md., assignor to Nuclear Battery Corporation, Columbia, Md.

Continuation of Ser. No. 489,737, July 18, 1974, abandoned. This application Oct. 20, 1976, Ser. No. 734,127
Int. Cl.[2] H01L *35/02*; G21H *1/10*
U.S. Cl. 136—202 4 Claims



1. In a microwatt thermoelectric generator including a sealed container having a feed-through assembly for making external electrical connection to the interior of the sealed container, a thermopile having a cold end and a hot end located within the sealed container with its cold end adjacent to the feed-through assembly and electrically connected therewith, a nuclear source located adjacent the hot end of the thermopile to furnish heat thereto, a foil insulation package located within the sealed container surrounding the thermopile and nuclear source, and getter means located within said foil insulation package, the improvement of the getter means comprising gas permeable container means containing a sintered mass of barium particles having distributed therethrough thin filler wire.

4,073,666

METHOD FOR MAKING AN INSULATED SUPERCONDUCTOR AND ARTICLE PRODUCED THEREBY

William G. Marancik, and Frederick T. Ormand, both of Basking Ridge, N.J., assignors to Airco, Inc., Montvale, N.J.

Filed Sept. 9, 1976, Ser. No. 721,739
Int. Cl.[2] H01L *39/00, 39/24*
U.S. Cl. 148—11.5 Q 4 Claims

1. A method for manufacturing an insulated composite conductor comprising the steps of:

a. lining the inner walls of an extrusion can made of a ductile material with a layer of valve metal selected from the group consisting of Ti, Nb, Hf and Ta;

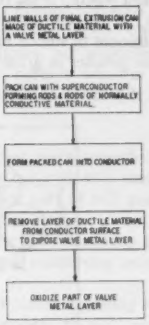
b. packing a plurality of superconductor forming rods made of superconductor forming material into the extrusion can;

c. mechanically forming a composite conductor from the packed can wherein the conductor has filaments of superconductor forming material;

d. removing the ductile material layer of the can from the surface of the composite conductor to expose the underlying layer of valve metal;

e. oxidizing at least part of the exposed layer thereon; and

f. heat treating the product to react components of the superconductor forming rods to form, in situ, filaments of material selected from the group consisting of Nb_3Sn and V_3Ga having superconductive properties at cryogenic temperatures.


LINE WALLS OF FINAL EXTRUSION CAN MADE OF DUCTILE MATERIAL WITH A VALVE METAL LAYER
PACK CAN WITH SUPERCONDUCTOR FORMING RODS & RODS OF NORMALLY CONDUCTIVE MATERIAL
FORM PACKED CAN INTO CONDUCTOR
REMOVE LAYER OF DUCTILE MATERIAL FROM CONDUCTOR SURFACE TO EXPOSE VALVE METAL LAYER
OXIDIZE PART OF VALVE METAL LAYER

4,073,667

PROCESSING FOR IMPROVED STRESS RELAXATION RESISTANCE IN COPPER ALLOYS EXHIBITING SPINODAL DECOMPOSITION

Ronald N. Caron, Branford, and Stanley Shapiro, New Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 655,791, Feb. 6, 1976, Pat. No. 4,016,010. This application Nov. 19, 1976, Ser. No. 743,121
The portion of the term of this patent subsequent to Apr. 5, 1994, has been disclaimed.
Int. Cl.[2] C22F *1/08*
U.S. Cl. 148—12.7 C 18 Claims

1. A method for obtaining precipitation hardened copper base alloys via continuous, coherent precipitation such as spinodal decomposition having high strength and favorable strength to ductility characteristics which comprises:

a. providing a copper base alloy selected from the group consisting of those Cu-Ti alloys, Cu-Be alloys and Cu-Ni base alloys which exhibit continuous, homogeneous precipitation of coherent particles upon precipitation hardening;

b. hot working said alloy with a finishing temperature in excess of 400° C;

c. solution annealing said alloy for from 10 seconds to 24 hours at a temperature of from 650° to 1100° C; and

d. cooling the alloy to room temperature at a rate of less than 650° C per minute

to provide a spinodal, precipitation hardened copper base alloy wherein the microstructure is characterized by the presence of finely dispersed precipitates of alloying element-rich particles dispersed throughout the copper alloy matrix.

4,073,668

METHOD OF PRODUCING SILICON STEEL STRIP

George E. Wieland, Jr., and Eugene M. Rudzki, both of Bethlehem, Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

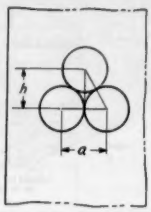
Filed Sept. 15, 1976, Ser. No. 723,365
Int. Cl.[2] H01F *1/04*
U.S. Cl. 148—113 2 Claims

1. A method of producing silicon sheet steel comprising:

a. coating both sides of a low carbon steel substrate with a slurry of a silicon-containing powder, at least 90% of the particles of said powder having a diameter equal to or less than *d*, and the maximum diameter of the particles being 1.25*d*, where:

$$d = \frac{1.65t\,(\%Si_{pr})10^7}{(100 - \%Si_{pr})\,(\%Si_p)\,(\rho_p)},$$

in microns, and where t is the thickness of the substrate in inches, $\%Si_{pr}$ is the desired silicon in the final product, $\%Si_p$ is the amount of silicon in the powder, and ρ_p is the density of the powder in g/cm^3,



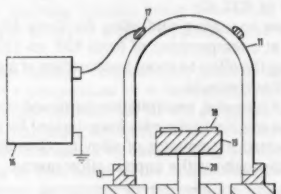
b. drying said slurry on said substrate to provide a coating,
c. compacting said powder particles on said substrate, and
d. heating said substrate with the compacted powder thereon in a protective environment for a time and at a temperature sufficient to cause uniform diffusion of silicon throughout said substrate.

4,073,669

PLASMA ETCHING

Rudolf August Herbert Heinecke, and Geoffrey Laurence Ashcroft, both of Harlow, England, assignors to ITT Industries, Incorporated, New York, N.Y.

Filed Apr. 29, 1976, Ser. No. 681,664
Int. Cl.² C23F *1/02*
U.S. Cl. 156—643 **5 Claims**



1. A method for selectively etching an aluminum film carried on a semiconductor substrate, comprising:
selectively masking the aluminum film with a photoresist material;
exposing the masked film to a radio-frequency glow discharge maintained in an atmosphere comprising carbon tetrachloride together with up to 15 volume percent ammonia; and
stripping of the photoresist mask to obtain a finished semiconductor substrate carrying an aluminum conductor pattern thereon.

4,073,670

METHOD OF FORMING NARROW RIBBONS OF FIBERS IN PLASTIC MATERIAL

Panchanan Mitra, Stapleford, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 16, 1976, Ser. No. 742,308
Claims priority, application United Kingdom, Nov. 27, 1975, 48723/75
Int. Cl.² B32B *5/00*
U.S. Cl. 156—179 **12 Claims**

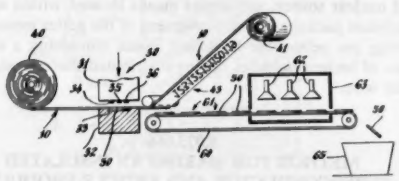
1. A method of preparing ribbons of unidirectional fiber-reinforced plastics material, comprising the steps of
1. laying unidirectional fibers in a series of spaced discrete parallel strips onto a plastics material on a backing comprising a first continuous sheet of release material,
2. applying a second continuous sheet of release material to the fibers,
3. applying heat and pressure such that the plastics material flows about the fibers to form a series of coherent strips,
4. removing only one of the layers of release material,
5. applying a continuous solid sheet which will adhere to surplus plastics material between each coherent strip, and
6. removing the said continuous solid sheet with the surplus plastics material adhering thereto.

4,073,671

COLOR FILLING INDICIA SIMULTANEOUSLY WITH DEBOSSING

Aurelio William Licata, New Haven, Conn., assignor to Seton Name Plate Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 430,092, Jan. 2, 1974, abandoned. This application Nov. 14, 1975, Ser. No. 631,814
Int. Cl.² B31B *31/00*
U.S. Cl. 156—219 **5 Claims**



1. A method of forming color-filled debossed indicia on metal substrates comprising:
a. positioning a metal substrate below means including indicia die means for debossing indicia thereon, said indicia die means having a flat indicia-forming surface;
b. interposing a colored tape comprising a layer of resinous film and a layer of thermosct adhesive between the die means and the metal substrate with the thermoset adhesive layer adjacent to the metal substrate;
c. maintaining the metal substrate and tape at a temperature below the melt point of the thermoset adhesive prior to debossing; and
d. applying the die means to the tape and metal substrate by stamping with sufficient force to deboss the indicia in the metal substrate and to shear the tape along the outline of the indicia whereby a portion of the tape corresponding to the shape and area of the indicia is sheared away from the surrounding tape and positioned adhered on the surface of the debossed indicia.

4,073,672
POST-PRESS EMBOSSING OF A CONSOLIDATED MAN-MADE BOARD

John T. Clarke, St. Charles; Royce K. Harker, Lombard, both of Ill.; Michael E. Hittmeier, Towanda, Pa., and James W. Eaton, Elgin, Ill., assignors to Masonite Corporation, Chicago, Ill.

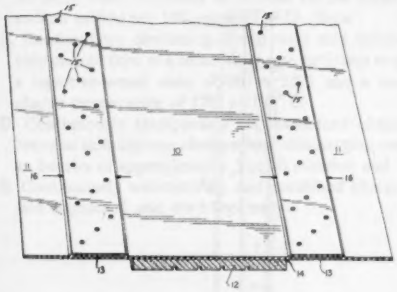
Continuation-in-part of Ser. No. 537,254, Dec. 30, 1974, Pat. No. 4,007,076. This application Sept. 27, 1976, Ser. No. 727,292
The portion of the term of this patent subsequent to Feb. 8, 1994, has been disclaimed.
Int. Cl.[2] B29J *5/04*
U.S. Cl. 156—219 16 Claims

12. In a method of forming a decorative board including depositing fibers onto a surface to form a fibrous mat and compressing said fibrous mat to consolidate said mat into a consolidated board the improvement comprising wetting a surface of said consolidated board with a mineral acid in an amount sufficient to wet substantially the entire surface to be embossed, embossing the wetted surface of said consolidated board with a contoured embossing surface at a pressure of at least 1000 p.s.i., at a temperature of at least 400° F. and for a period of time sufficient to permanently re-shape said wetted surface.

4,073,673
PROCESS FOR PRODUCING AN EXPANSION JOINT COVER

Paul J. Raabe, Oak Brook, Ill., and Harlan E. Tarbell, Torrance, Calif., assignors to Grefco, Inc., Bala Cynwyd, Pa.

Continuation-in-part of Ser. No. 431,766, Jan. 8, 1974, which is a continuation of Ser. No. 346,112, March 29, 1973, which is a continuation-in-part of Ser. No. 113,835, Feb. 9, 1971, abandoned. This application Dec. 23, 1975, Ser. No. 643,807
Int. Cl.[2] B29F *3/10*
U.S. Cl. 156—244 2 Claims



1. A process for producing a flexible, weather resistant, hinged expansion joint cover including a flexible strip and flexible hinged lateral portions having lock-in reinforcing members, and insulating material adjacent said planar strip,

said flexible strip and portions being fabricated of extrudable material, said extrudable material being a resinous polymer extrudable when in a flowable state, and selected from the group consisting of polymers of polyethylenes, polypropylenes, polyurethanes, polyamides, polychloroprenes, polybutadienes, polyacrylonitriles, polyvinyl chlorides or polyacrylates, wherein said resinous polymer remains flexible and penetrable by a nail within the range of from about −50° about +200° F, and withstands prolonged direct exposure to outdoor weathering;

said reinforcing member comprised of a strip of relatively thin planar spring material, said strip being perforated and having a rigidity substantially greater than that of said lateral portions and a thickness less than that of said lateral portions, said reinforcing member if coiled about a 5" diameter mandrel and released, being elastic so as to return to its original shape;

said insulating material being planar and compressible, said insulating material being a polymeric foam selected from the group consisting of foamed polymers and copolymers of ethylene, propylene, choroprene, vinyl halides, urethanes, amides, butadienes, acrylonitriles, acrylates and natural and synthetic rubbers wherein said polymeric foam has a K factor of from about 0.012 to about 0.045 Btu-in/ft^2-hr-=F;

comprising the steps of:

(a) simultaneously extruding said substantially flexible planar strip of said extrudable material, with said lateral portions extended one from each side of said planar strip in the same plane as said planar strip;

(b) simultaneously placing and completely enclosing during said extrusion one of said reinforcing members in each of said lateral portions;

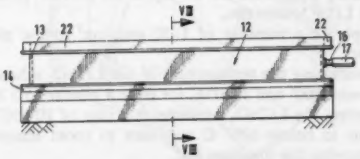
(c) aligning a strip of said planar insulating material adjacent said planar strip subsequent to said extrusion step and confining said insulating material slightly within the edges of said planar strip, and

(d) fastening said strip of said insulating material in said aligned position to said planar strip to form a flexible hinge between said planar strip and said lateral portions and produce said flexible hinged expansion joint cover.

4,073,674
METHOD FOR PRODUCTION OF MULTILAYER COMPOSITE PLATE

Willy Hörtel, An der B4, 3125 Wesendorf, Germany

Filed Apr. 19, 1976, Ser. No. 678,201
Claims priority, application Germany, Apr. 24, 1975, 2518174
Int. Cl.[2] B29C *3/00*
U.S. Cl. 156—285 3 Claims

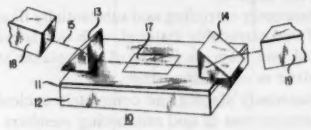


1. A method of producing a multilayer composite plate construction, comprising the steps of laminating at least one hard foam layer of polystyrene having a thickness of at least 40 mm. and a density of at least 25 kp/m^3 between outer layers formed of fibrous materials, said outer layers statically absorbing bending tensile and compressive forces when said plate construction is under load, said laminating step including applying a two-component adhesive having talc as a filler to substantially the entire faces of the mating surfaces of said foam and said outer layers, locating said outer layers with said foam therebetween and the adhesive applied thereto in a pressing frame and applying an exterior force to said layers and foam that is sufficient to produce a bonded laminate while simultaneously reducing the pressure in said frame to a partial vacuum to remove the air pockets and gases in the bonding layers and to stabilize the foam layer.

4,073,675
WAVEGUIDING EPITAXIAL $LINBO_3$ FILMS

Albert Anthony Ballman, Woodbridge; Harold Brown, Middletown; Raymond John Martin, Middlesex Borough, and Ping King Tien, Chatham Township, Morris County, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 21, 1976, Ser. No. 707,309
Int. Cl.² B01J *17/24;* **C01G** *35/00, 1/00*
U.S. Cl. 156—600 **8 Claims**



1. A process for producing epitaxial crystalline films of $LiNbO_3$ on $LiTaO_3$ substrates in which the films are grown on a crystallographic plane of $LiTaO_3$ selected from the group consisting of the 10.2, 11.2, 01.2, 10.2, 01.2 and 11.2 planes comprising the steps of:

a. preparing the $LiNbO_3$ in the form of a powder with particle size less than 50 microns,
b. preparing a suspension of $LiNbO_3$ in a viscous liquid organic medium which evaporates or decomposes on heating,
c. spreading some of the suspension of $LiNbO_3$ on the $LiTaO_3$ substrate,
d. heating the $LiTaO_3$ substrate to a temperature between 1260° and 1320° C,
e. maintaining the temperature of the $LiTaO_3$ substrate between 1260° and 1320° C for from 1 minute to 2 hours,
f. cooling the $LiTaO_3$ substrate at a rate of 10°–50° C per hour to below 600° C.

6. A process for producing epitaxial crystalline films of $LiNbO_3$ on $LiTaO_3$ substrates in which the films are grown on a crystallographic plane of $LiTaO_3$ selected from the group consisting of the 10.2, 11.2, 01.2, 10.2, 01.2 and 11.2 planes comprising the steps of:

a. preparing the $LiNbO_3$ in the form of a powder with particle size less than 50 microns,
b. distributing some $LiNbO_3$ powder on the surface of the $LiTaO_3$ substrate,
c. placing a platinum foil on top of the $LiNbO_3$ powder on the $LiTaO_3$ substrate,
d. applying a pressure of 1–20 gms/cm² to the platinum sheet,
e. maintaining the temperature of the $LiTaO_3$ substrate between 1260° and 1320° C for from 1 minute to 2 hours,
f. cooling the $LiTaO_3$ substrate at a rate of 10°–50° C per hour to below 600° C and then to room temperature, removing the platinum foil.

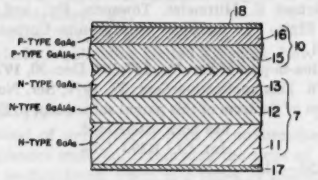
4,073,676
GaAs-GaAlAs SEMICONDUCTOR HAVING A PERIODIC CORRUGATION AT AN INTERFACE

Kunio Aiki, Hachioji; Michiharu Nakamura, Nishitama, and Junichi Umeda, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 18, 1975, Ser. No. 550,769
Claims priority, application Japan, Feb. 18, 1974, 49-18630
Int. Cl.² B01J *17/04*
U.S. Cl. 156—624 **9 Claims**

1. A method for fabricating a semiconductor device having a periodic corrugation at an interface between a GaAs crystal and a GaAlAs layer comprising the steps of:

preparing a GaAs crystal;
selectively etching the surface of said GaAs crystal, to form a periodic corrugation on the surface of said GaAs crystal;
preparing a solution including Ga, Al and As therein;
heating said solution to a temperature within a range between 650° C and 750° C;

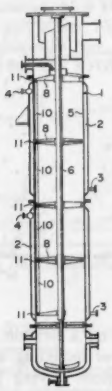


contacting said heated solution onto said periodically corrugated surface of said GaAs crystal; and
cooling said solution at a cooling rate between 1° C/min. and 10° C/min.

4,073,677
REVERSIBLY ROTATED WIPER IN AN EVAPORATOR

Yasuo Noda, Amagasaki, and Takaya Inoue, Takatsuki, both of Japan, assignors to Kansai Kagaku Kikai Seisaku Kabushiki Kaisha, Japan

Filed Sept. 15, 1976, Ser. No. 723,450
Claims priority, application Japan, Sept. 26, 1975, 50-115537
Int. Cl.² B01D *1/22*
U.S. Cl. 159—6 W **6 Claims**



1. A thin-film evaporator comprising a substantially cylindrical heating wall, a rotating shaft disposed coaxially with respect to said heating wall, a reversible motor connected to said shaft for rotating it in opposite directions, blade means mounted on said rotating shaft for applying liquid to be evaporated to said heating wall to form a thin film thereon when said shaft is rotated by said motor in one direction and scraping means on said rotating shaft for scraping possible scales off said heating wall, said scraping means being adapted to rub against said heating wall with slight contact pressure when said shaft is rotated in said one direction and on the other hand to engage with said heating wall with larger pressure when said shaft is rotated in the other direction whereby the scales on the heating wall are scraped off therefrom.

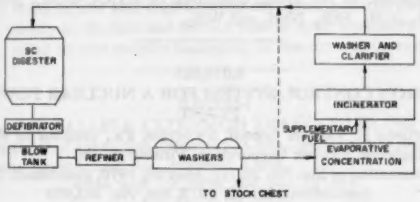
4,073,678
HIGH YIELD SEMICHEMICAL WOOD PULPING PROCESS

Jack A. Hammond, Covington, Va., and Elias M. Karter, Paducah, Ky., assignors to Westvaco Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 351,658, April 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 248,868, May 1, 1972, abandoned. This application Jan. 14, 1977, Ser. No. 759,455

Int. Cl.[2] D21C *3/02, 3/24, 11/04*

U.S. Cl. 162—19 8 Claims



1. A method of operating a continuous digester having respective charging and discharging ends for the production of semichemical pulp of greater than 70% yield, said method comprising steps of:

A. Formulating a green liquor pulping solution having 50 to 150 grams per liter total alkali concentration measured as sodium oxide wherein at least 50% of said total alkali is derived from sodium carbonate, said solution further including an effective presence of sodium sulfide;

B. Continuously charging said digester at said charging end with said solution and wood chips at a combined flow rate providing 5 to 10 grams of titratable sodium compounds expressed as sodium oxide per 100 grams of O.D. chips but no more than 2.4 grams of sodium sulfide measured as sodium sulfide per 100 grams of O.D. chips;

C. Continuously combining steam with said solution and chip charge flow at a steam flow rate sufficient to provide a liquor-to-wood ratio of up to 2.5:1 and a combined charge temperature of 170° to 185° C;

D. Continuously transporting said combined charge flow between said digester charging and discharging ends over an interim of approximately 5 to 20 minutes; and

E. Continuously withdrawing said combined charges from said digester at said discharge end.

4,073,679
CYLINDER FOR FORMING, GUIDING AND/OR TRANSPORTING PAPER WEBS OR THE LIKE

Christian Schiel, Heidenheim, Germany, assignor to J. M. Voith GmbH, Heidenheim, Germany

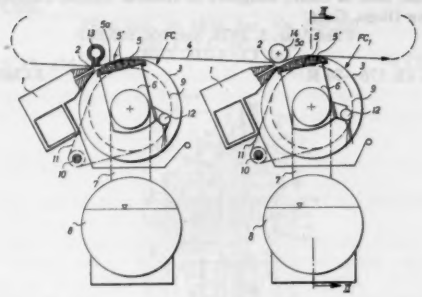
Filed Nov. 19, 1976, Ser. No. 743,301

Claims priority, application Germany, Nov. 22, 1975, 2552485

Int. Cl.[2] D21F *1/46, 1/60, 3/10*

U.S. Cl. 162—306 18 Claims

1. In a machine for forming, guiding and/or transporting elongated webs of fibrous material which move along a predetermined path, particularly in the wire section of a papermaking machine, a combination comprising a hollow cylinder including a deformable tubular shell adjacent one side and extending transversely of said path, said shell being permeable to fluids, consisting of intersecting filaments which define a plurality of interstices, and having first and second end portions, an external surface including a web-contacting portion and an internal surface, and rigid rotary walls connected with said end portions of said shell; and a rigid back support located in the interior of said cylinder and having a back support surface contacting said internal surface of said shell substantially only opposite said web-contacting portion of said external surface.



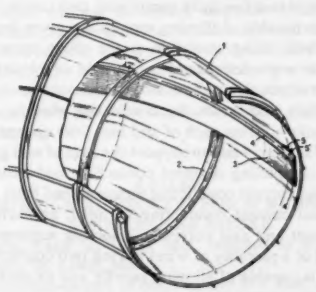
4,073,680
TOROIDAL BAND LIMITER FOR A PLASMA CONTAINMENT DEVICE

George G. Kelley, Kingston, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed June 26, 1975, Ser. No. 590,746

Int. Cl.[2] G21B *1/00*

U.S. Cl. 176—3 3 Claims



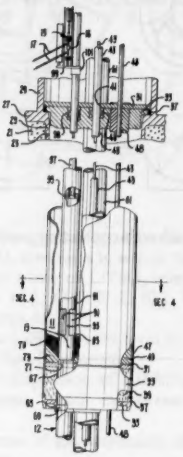
1. In a toroidal plasma confinement device having poloidal and toroidal magnetic fields for confining a toroidal plasma column with a plasma current induced therein along an endless, circular equilibrium axis in a torus vacuum cavity, the improvement comprising a toroidal plasma band limiter mounted on the midplane inside of and to the wall of said cavity and at the outer radius of said plasma, said band limiter extending around the perimeter of said plasma, said band limiter being tangent at its mid-region to the outermost plasma surface and flaring away from said plasma at the top and the bottom of the band to intercept a shell of plasma surfaces in the plasma scrape-off region, thus receiving a generally uniform energetic particle flux therefrom, thereby avoiding intense local heating of said band limiter while at the same time preventing vacuum cavity wall damage.

4,073,681

NUCLEAR REACTOR SHUTDOWN SYSTEM

James M. Glazar, Poway, and Erich H. P. Hoffmann, Escondido, both of Calif., assignors to General Atomic Company, San Diego, Calif.

Filed Mar. 5, 1975, Ser. No. 555,687
Int. Cl.[2] G21C 7/08
U.S. Cl. 176—36 R 3 Claims



1. A shutdown system for a nuclear reactor comprising, a poison reservoir, gate means movable from a closed position to an open position by the force of gravity, means for conducting poison in said reservoir to the core of the reactor in response to the opening of said gate means, means for retaining said gate means in the closed position, said retaining means comprising a pulley, a flexible cable passing partially around said pulley, and a pair of fuse links, each linking one end of said cable with said gate means and extending substantially parallel with each other, each of said fuse links comprising two contacting metallic elements capable of alloying rapidly at a given temperature, said fuse links being severable at the given temperature in response to a predetermined magnitude of electric current passed therethrough to allow said gate means to move to the open position, and means for conducting electric current to said fuse links wherein each of said fuse links comprises a main element of sufficient size to support the load of said gate means, a current conducting segment contacting said main element, wherein said current conducting means extend from respective ends of said current conducting segment, and wherein said main element and said current conducting segment are each comprised of a plurality of wires having two contacting metallic elements capable of alloying rapidly and exothermically at said given temperature.

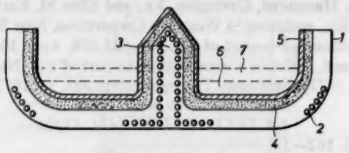
4,073,682

NUCLEAR REACTOR CORE CATCHING APPARATUS

Leopold Barleon, Karlsruhe; Stefan Dorner, Pforzheim; Odo Goetzmann, Philippsburg, and Guenter Kussmaul, Karlsruhe, all of Germany, assignors to Gesellschaft fuer Kernforschung, Karlsruhe, Germany

Filed Dec. 16, 1974, Ser. No. 533,250
Claims priority, application Germany, Dec. 21, 1973, 2363845
Int. Cl.[2] G21C 9/00
U.S. Cl. 176—38 5 Claims

1. Apparatus for containing the components of a nuclear reactor core in a core melt-down accident, said apparatus consisting of a container adapted to be disposed below the neclear reactor core and consisting of stainless steel provided with a layer of compressed graphite, and having disposed at its inside facing the reactor core on top of the compressed graphite layer a top layer of graphite in combination with at least one



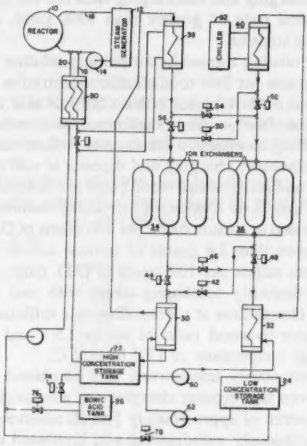
compound of the group consisting of Al_4C_3, α-SiC, β-SiC, TiB_2, ZrB_2, HfB_2, NbB_2 and WSi_2.

4,073,683

BORON CONTROL SYSTEM FOR A NUCLEAR POWER PLANT

Martinus R. Van der Schoot, Swissvale, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 38,711, May 19, 1970, abandoned. This application May 22, 1973, Ser. No. 362,989
Int. Cl.[2] G21C 7/00
U.S. Cl. 176—86 L 5 Claims



1. Apparatus for providing an inventory of both a concentrated solution of a neutron capturing material and a dilute solution of same for control of a nuclear reactor, which comprises:

a first vessel and a second vessel connected to said reactor, each vessel having a solution containing neutron capturing material:

at least two ion exchangers being temperature dependent with respect to their storage capacity of neutron capturing material;

conduits connecting the vessels with said ion exchangers;

a heater and pump in the conduit between the first vessel and a first of said ion exchangers, said heater imparting heat to a solution circulated from the first vessel to the first ion exchanger wherein the solution rinses neutron capturing material from the ion exchanger during its flow therethrough thus increasing the concentration of neutron capturing material therein; and

means connecting the discharge side of said first ion exchanger to said second vessel for discharging the solution of higher concentration thereinto;

a cooler and pump in the conduit between the second vessel and the second ion exchanger, said cooler extracting heat from a solution circulated from the second vessel to the second ion exchanger wherein the solution gives up neu-

tron capturing material and stores it in the second ion exchanger thus decreasing the concentration of neutron capturing material in said solution; and

means connecting the discharge side of said second ion exchanger with the first vessel for discharging the solution of lower concentration thereinto and;

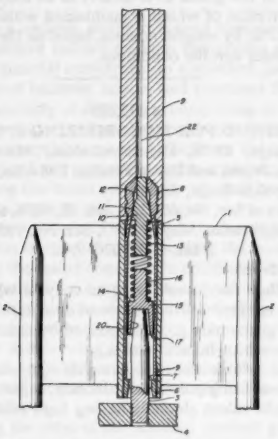
separate means are connected to opposite sides of said first and second ion exchangers for selectively diverting the solutions from the heater and cooler respectively to said second and first ion exchangers, and from the outlet of said second and first ion exchangers respectively to the second and first vessels; thereby providing separate solutions of low and high neutron capturing material respectively in the first and second vessels to be separately supplied to said reactor according to reactor requirements.

4,073,684

RELEASABLE EXTENSION SHAFT COUPLING

Martin D. Cepkauskas, Simsbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Sept. 27, 1976, Ser. No. 727,068
Int. Cl.² G21C *7/10*
U.S. Cl. 176—86 R **3 Claims**



1. In a nuclear reactor, a control element assembly, including,

a spider from which the control rod assembly depends,

an axial bore in the spider,

collet fingers attached to the spider at a position within the spider bore with their upper ends extended above the spider,

a plunger positioned within the upper ends of the collet fingers to carry a flared surface of the plunger against the internal surface of the collet fingers in applying a lateral force to the fingers when the plunger is moved upward,

a buffer pin fixedly attached to a support plate in the nuclear reactor for cooperation with said control element assembly,

a piston positioned within the axial bore of the spider below the plunger for engagement with said buffer pin inserted into the spider bore from below,

and a spring element positioned in the axial bore of the spider to extend between the plunger and piston and exert its force on both,

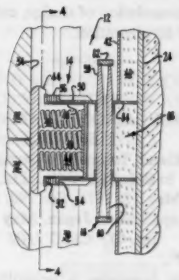
such that collet fingers are spread into engagement with a collet gripper on a control rod extension shaft assembly and the piston exerts a buffer force on said buffer pin contacting the piston from below.

4,073,685

REACTOR CORE LATERAL RESTRAINT ASSEMBLY

Stanley J. Brown, and Wilhelm Gorholt, both of San Diego, Calif., assignors to General Atomic Company, San Diego, Calif.

Filed Feb. 20, 1976, Ser. No. 659,597
Int. Cl.² G21C *13/04*
U.S. Cl. 176—87 **9 Claims**



1. In a nuclear reactor including a vessel forming a shielded cavity with a reactor core being arranged within the cavity in generally spaced-apart relation from the vessel and vertically supported in a manner permitting at least limited movement of the core relative to the vessel along three perpendicular axes, a lateral restraint assembly comprising

a plurality of spring packs arranged in spaced-apart relation from each other between lateral surfaces of the reactor core and the vessel, each of the spring packs including

at least one coil spring providing a relatively low-rate spring means and permitting multi-axial movement,

a relatively high-rate spring means,

means connecting the relatively low-rate coil spring with one of the core and vessel,

means connecting the relatively high-rate spring means with the other of the core and vessel,

means interconnecting the relatively low-rate coil spring with the relatively high-rate spring means, and

stop means limiting the spring response of the relatively low-rate coil spring so that initial multi-axial movement of the core relative to the vessel tends to be absorbed by the relatively low-rate coil spring while movement of the core relative to the vessel is resisted by the relatively high-rate spring means after the stop means limits response of the coil spring.

4,073,686

BIOLOGICAL PROCESS FOR SCRUBBING SMOKEHOUSE SMOKE

Jac Adams, Lake St. Louis, Mo., assignor to Krey Packing Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 649,913, Jan. 16, 1976, abandoned. This application Jan. 17, 1977, Ser. No. 760,224
Int. Cl.² C12B *1/00*; B01D *47/00*
U.S. Cl. 195—2 **9 Claims**

1. For scrubbing the smokes of meat processing plants, the process comprising the steps of

conducting said smoke containing particulate and gaseous organic matter into a column inlet, up through an air-pervious filler material within such column, and toward an outlet of such column,

mixing into water hydrolytic enzymes and aerobic bacteria,

trickling said water through said filler material thereby to form an interface between said water and said smoke containing particulate and gaseous organic matter,

dissolving such particulate and gaseous organic matter by partial hydrolysis with said enzymes at such interface,

by said enzymes further hydrolyzing said dissolved partially hydrolyzed matter into metabolizable subunits,

maintaining said aerobic bacteria in said mixture without sufficient organic material to support their growth and reproduction, and

oxidizing to substantial completion said metabolizable subunits by said acrobic bacteria without causing same to reproduce,

whereby such particulate and gaseous organic matter is effectively oxidized to carbon dioxide and water without substantial accumulation of sludge, cell mass, or dissolved byproducts of fermentation.

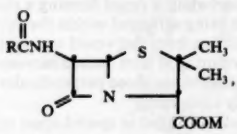
4,073,687

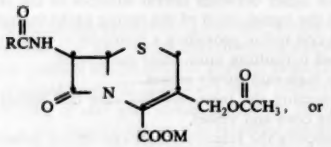
ENZYMATIC ACYLATION TO AFFORD β-LACTAM ANTIBIOTICS

Eiji Kondo, Ikeda, and Takashi Mitsugi, Izumiotsu, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

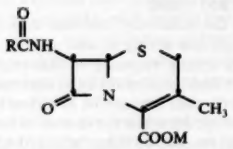
Filed May 12, 1976, Ser. No. 686,219
Claims priority, application Japan, May 14, 1975, 50-57844
Int. Cl.[2] C12D *1/02*
U.S. Cl. 195—36 P **11 Claims**

1. A process for preparing a penicillin or cephalosporin antibiotic of the formula





or



wherein

is an acyl group derived from an α-amino acid, an N- ammonium salt of an α-amino acid or an N—(C_1 to C_{10}) acyl-α-amino acid and COOM is carboxy or a carboxylate salt group, which comprises reacting an amino compound selected from the group consisting of 6-aminopenicillanic acid, 7-aminocephalosporanic acid, 7-aminodeacetoxycephalosporanic acid and salts thereof with an ester of the formula

wherein

is as defined above and R^1 is a (C_1 to C_{10}) alkyl group, by enzymatic acylation effected with mycelium or mycelium preparation from a microorganism belonging to the genus *Aphanocladium* or to *Cephalosporium caremoioides* Raillo.

4,073,688

PROCESS FOR THE PREPARATION OF A PROTEINACEOUS CONCENTRATE

Ladislav Forman; Milos Mergl; Jiri Mostecky; Milos Teply, and Jiri Uher, all of Prague, Czechoslovakia, assignors to Vysoka skola chemicko-technologicka, Prague, Czechoslovakia

Filed Dec. 29, 1975, Ser. No. 644,918
Int. Cl.[2] C12C *11/00, 11/12;* C12B *1/00*
U.S. Cl. 195—49 **4 Claims**

1. In a process for the preparation of a proteinaceous concentrate by aerobic activation of yeast wherein a protein-poor whey selected from the group consisting of sweet whey and acid whey is enriched with nitrogenous substances, the pH of the enriched whey is adjusted with an acid, mineral constituents are added to the whey and fermentation thereof is effected in the presence of oxygen, the improvement which comprises, subsequent to the fermentation step, heating the whey to a boil to effect coagulation of foam-forming substances, cooling the whey to a temperature within the range of 26°–34° C, adjusting the pH of the resultant solution to a value within the range of 4.0–6.0 and subjecting said solution to a second fermentation with yeast of the genus CANDIDA in an alcoholic medium, the concentration of which is maintained within the range of from 0.1–0.2%, by weight, ethanol, based on the weight of said medium, under aerobic conditions.

4,073,689

METHOD FOR IMMOBILIZING ENZYME

Ryoichi Senju, 41-18, Higashiwakahisa, Minami, Fukuoka, Fukuoka, Japan, and Hiroo Tanaka, Fukuoka, Japan, assignors to Ryoichi Senju, Japan

Continuation of Ser. No. 653,261, Jan. 28, 1976, abandoned. This application May 9, 1977, Ser. No. 795,133
Int. Cl.[2] C07G *7/02*
U.S. Cl. 195—63 **11 Claims**

1. A method for immobilizing an enzyme which comprises reacting an enzyme with a compound or material having multivalent halogenoamide groups obtained by reacting

a. a polycarboxylic acid amide,

b. a water-soluble multi-valent amide compound obtained by carbamoylizing polyhydric alcohols, sugars or water-soluble multi-valent alcohols having high molecular weight, or

c. a carbamoylized solid carrier having amide groups

with a hypohalogenite in an alkaline medium.

11. An immobilized enzyme produced by the method according to claim 1.

4,073,690

CITROBACTER FREUNDII BROTH

Sandra F. Gibson, St. Louis, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed May 3, 1976, Ser. No. 682,654
Int. Cl.[2] C12K *1/06*
U.S. Cl. 195—100 **10 Claims**

1. A broth medium for selective identification of *Citrobacter freundii* comprising:

a. a source of nutrients including at least one sugar that specifically enhances the growth of *C. freundii* and is fermentable by *C. freundii* to acidify the said broth, said sugars being selected from palatinose, rhamnose, and combinations thereof,

b. a gram-positive inhibitor, and

c. an inhibitor to inhibit the growth of organisms that give false positive results in tests for *C. freundii,*

d. said broth medium being responsive to a pH change toward and induced by said sugar fermentation by *C. freundii* to indicate the presence of *C. freundii* in said broth.

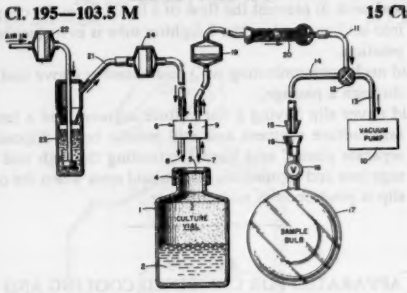
4,073,691

METHOD FOR DETECTING THE PRESENCE OF BIOLOGICALLY ACTIVE AGENTS

Joseph E. Ahnell, Baltimore; Rodney L. Broman, Falston, and John R. Waters, Towson, all of Md., assignors to Johnston Leonard L. Ciaccio, 55 Yardley Court, Glen Rock, N.J. 07452, and Klaus Hameyer, 947 Round Bay Road, Norfolk, Va 23502

Int. Cl.[2] C12K *1/04*

U.S. Cl. 195—103.5 M 15 Claims



1. A method for detecting the presence of bacteria comprising the steps of:

a. providing a sealable, sterile container containing a sterile, non-radioactive culture medium comprising at least one substrate material convertible to a selected gaseous product by direct bacterial action, said container further containing a quantity of culture gas comprising an inert reference gas in said container above said culture medium, said container comprising means to facilitate the introduction of a sample of test material into the container;

b. determining the initial ratio of the selected product gas to the reference gas in said culture gas;

c. introducing a sample of material to be tested for bacterial activity into the container and sealing the container;

d. subjecting the sealed container to conditions conducive to bacterial growth for a predetermined period of time sufficient for fermentation of the culture medium to produce the selected gaseous product;

e. thereafter withdrawing a sample of the culture gas from said sealed container and determining the ratio of the selected product gas to reference gas in the culture gas sample; and

f. comparing the ratio of the selected product gas to reference gas in the culture gas sample to the initial ratio of selected product gas to reference gas in the culture gas.

4,073,692

METHOD AND APPARATUS FOR AUTOMATED MEASUREMENT OF ENERGY OXYGEN

Leonard L. Ciaccio, 55 Yardley Court, Glen Rock, N.J. 07452, and Klaus Hameyer, 947 Round Bay Road, Norfolk, Va. 23502

Filed Apr. 21, 1975, Ser. No. 570,089

Int. Cl.[2] C12B *1/00*

U.S. Cl. 195—103.5 R 18 Claims

1. Apparatus for determining the amount of dissolved oxygen consumed by microorganisms while assimilating biologically oxidizable material in a liquid medium, comprising:

a. first supply means for producing and supplying a liquid saturated with a gas containing oxygen;

b. second supply means for introducing a measured sample of said liquid medium containing biologically oxidizable material into said oxygen containing liquid;

c. reactor means containing said microorganisms in sessile condition and having an inlet and outlet port communicating with said first supply means, wherein said microorganisms consume a portion of said oxygen in reacting with said biologically oxidizable material;

d. pump means interconnecting said first supply means and said reactor means for continuously recirculating said mixture of sample and oxygen containing liquid medium through said reactor means and said first supply means;

e. analytical means for automatically measuring the amount of dissolved oxygen consumed by said microorganisms in said reactor means; and

f. timer means interconnected with said second supply means, said pump means and said analytical means for causing the same to operate in a timed relation to one another.

4,073,693

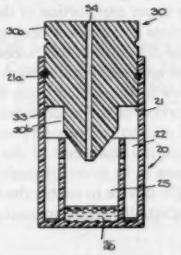
APPARATUS AND METHOD FOR CONDUCTING A PLURALITY OF BIOLOGICAL TESTS

Pierre R. Janin, New York, N.Y., assignor to American Home Products Corporation, New York, N.Y.

Filed June 8, 1976, Ser. No. 693,902

Int. Cl.[2] C12B *1/00*

U.S. Cl. 195—103.5 K 20 Claims



1. A biological testing device comprising:

a tubular container having an opening in its upper portion extending across the longitudinal axis of the tubular container, the lower portion of the tubular container being closed, structure forming a plurality of tubes disposed adjacent the inside periphery of the lower portion of the container, each tube having its length extending substantially parallel to the longitudinal axis of the container and having an open end portion facing the opening in the upper portion of the container and a closed end portion disposed opposite thereto, the tubes and the closed end portion of the container forming a central open chamber therewithin facing and substantially in alignment with the opening in the container, the chamber holding a biological test suspension; and

a predetermined chemical reagent material disposed at the closed end portion of each of said tubes; and

a plug for closing the upper portion of the container, the plug a cap portion and a neck portion narrower than the cap portion and adjacent thereto, the cap and neck portions forming a shoulder therebetween, the cap portion of the plug fitting slidingly and removably within the upper portion of the container to substantially seal the container, the plug having an initial position with respect to the container in which the cap portion of the plug is engaged with the upper portion of the container and the shoulder portion of the plug is spaced from the open end of each of the plurality of tubes, the plug in the initial position thereof enabling the test suspension to pass from the central open chamber to the shoulder of the plug when the testing device is inverted, the neck portion of the plug fitting slidingly and removably within the central open chamber and substantially sealing said chamber when the plug is fully inserted into the container, the plug having a final position with respect to the container in which the cap portion of the plug is further within the upper portion of the chamber, the neck portion of the plug engages and substantially seals the open central chamber and the shoulder portion of the plug is adjacent the open end of each of the plurality of tubes and substantially divides the test

specimen in an approximately equal amount with respect to each of the tubes, the divided test specimen being confined within the individual tubes as the testing device is reinverted.

19. A method for testing a bacterial suspension against a plurality of testing reagents, by employing a tubular container being open at one end portion and having disposed adjacent the inside periphery of the closed end portion, disposed opposite the end portion, a plurality of microtubes each having an opening facing the open end portion of the container, the container having an open central chamber, each of said plurality of microtubes being provided at its closed end opposite the opening thereof with a predetermined chemical reagent, wherein the method comprises the following steps:

a. depositing a sample of bacterial suspension to be tested into the bottom of the central chamber,
b. inserting a plug of predetermined configuration to a first position to seal the open-end portion of the tubular container, while leaving open the open ends of the microtubes, said plug having an upper portion slidingly fitting in the upper cap portion of the container in first and second positions and a lower neck portion slidingly fitting in the central chamber in said second position;
c. inverting the entire apparatus such that the bacterial suspension flows to the sealed open end portion below the open end portion of the microtubes;
d. moving said plug to said second position to seal the central chamber from the open end of the microtubes while the device remains in its inverted position; and
e. reinverting the device to enable the bacterial suspension to flow in substantially equal amounts to the individual microtubes.

4,073,694

MICROBIOLOGICAL ASSAY OF AMINOGLYCOSIDE ANTIBIOTICS

Dennis Buda, Baltimore; Rodney L. Broman, Baldwin, and John R. Waters, Towson, all of Md., assignors to Johnston Laboratories, Inc., Cockeysville, Md.

Filed Apr. 5, 1976, Ser. No. 673,359
Int. Cl.² C12K *1/00*
U.S. Cl. 195—103.7 **9 Claims**

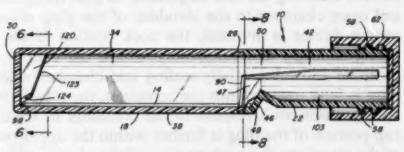
1. In a method of determining the concentration of an aminoglycoside antibiotic in blood wherein an aliquot of the liquid portion of blood from a patient being treated with said aminoglycoside antibiotic is incubated in a urea containing test medium with a susceptible strain of an adaptive urease producing microorganism, the improvement comprising using a microorganism having the characteristics of *Proteus rettgeri* JLI 03, ATCC No. 31168 as the adaptive urease producing microorganism.

4,073,695

LEIGHTON TUBE

George F. Lyman, Weston, Mass., assignor to Data Packaging Corporation, Cambridge, Mass.

Filed Aug. 11, 1976, Ser. No. 713,441
Int. Cl.² C12K *1/00, 9/00*
U.S. Cl. 195—127 **15 Claims**



15. A Leighton tube assembly comprising a tube closed at one end and open at the other, a neck adjacent said open end, a chamber toward said closed end which merges with said neck, means for closing said tube at said open end, and a cover slip,

said chamber having a wall with a flat portion lying, at its outside, in a plane through which no part of said tube penetrates so that said tube may be located in a substantially horizontal incubating position with said flat portion in contact with supporting planar horizontal surface.

an inwardly protruding dam lying between said chamber and neck to prevent the flow of a liquid from the chamber into said neck when the Leighton tube is in its incubating position,

said neck communicating with said chamber above said dam through a passage,

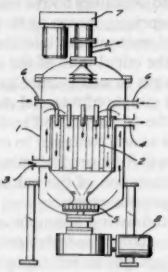
said cover slip having a flat culture segment and a handle, said culture segment and said handle being disposed in separate planes, said handle extending through said passage into and terminating within said neck when the cover slip is positioned in said chamber.

4,073,696

APPARATUS FOR COMBINED COOLING AND AERATION OF BIOCHEMICAL-ACTION VESSELS

Hans Müller, Im Almendli, Erlenbach, Zurich, Switzerland

Filed Mar. 17, 1975, Ser. No. 559,362
Claims priority, application Switzerland, Mar. 18, 1974, 3808/74; Sept. 10, 1974, 12389/74
Int. Cl.² C12B *1/16*
U.S. Cl. 195—142 **3 Claims**

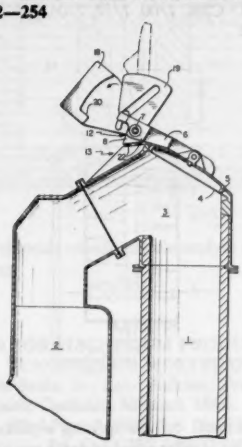


1. In an apparatus for growing microorganisms in a substrate, a combination comprising container means defining a chamber for the substrate; heat-exchange means in said chamber, including wall means defining a plurality of substantially vertically oriented channels for the substrate each having an upper and a lower end portion; means for advancing the substrate through said channels in a downward direction, including an impeller located downwardly of said lower end portions of said channels and operative for generating regions of suction in the substrate in said channels; and means for aerating the substrate, including a plurality of supplying pipes each of which extends from above into a respective upper end portion of one of said channels to bound an annular gap in said respective upper end with said wall means and each of which is operative for supplying an aerating gaseous medium to the respective region of suction in said one channel at the respective annular gap for the aerating gaseous medium to be entrained by the advancing substrate for joint advancement therewith first in said downward direction through the remainder of said one channel downstream of the respective supplying pipe, toward said impeller and then through the remainder of said chamber outside said heat exchange means so that the substrate issuing from said lower end portions of said channels of said heat-exchange means has a degree of aeration and a temperature which are optimum for the growth of the microorganisms present in the substrate.

4,073,697
IMPACT ABSORBING ATTACHMENT FOR RISER COVER

Martin Prötzl, Essen, Germany, assignor to Didier Engineering GmbH, Essen, Germany

Filed Oct. 14, 1976, Ser. No. 732,289
Claims priority, application Germany, Oct. 22, 1975, 7533508[U]
Int. Cl.² C10B *27/06*; F16F *15/04*
U.S. Cl. 202—254 **17 Claims**



1. In a riser for transmitting fill gases from a coke-oven chamber to a collecting main, said riser being of the type including a riser corner element having an opening therein, a cover fixedly mounted on a shaft, said shaft being rotatable to move said cover from a closed position covering said opening to an open position uncovering said opening, and means for rotatably mounting said shaft to said riser corner element, the improvement wherein said mounting means comprises:
   a supporting device rigid with said riser corner element;
   a cover bearing member separate from said supporting device, said shaft being rotatably mounted in said bearing member; means for attaching said bearing member to said supporting device; and
   at least one shock absorbing means, positioned between said bearing member and said supporting device, for damping impacts imparted to said bearing member due to opening of said cover.

4,073,698
METHOD AND DEVICE FOR THE DETECTION AND MEASUREMENT OF CARBON MONOXIDE IN THE PRESENCE OF HYDROGEN

Keith F. Blurton, Yorktown, and Joseph R. Stetter, Peekskill, both of N.Y., assignors to Energetics Science, Inc., Elmsford, N.Y.

Filed June 4, 1976, Ser. No. 692,919
Int. Cl.² G01N *27/46*
U.S. Cl. 204—1 T **9 Claims**

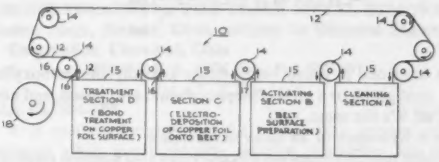
1. A method for the detection of carbon monoxide in the presence of interfering concentrations of hydrogen which comprises heating a gas sample containing said carbon monoxide and hydrogen in an oxidizing atmosphere at a temperature of at least 700° C in a non-catalytic reaction zone to selectively oxidize the hydrogen to water, and passing the gaseous reaction product from the selective oxidation to an electrochemical carbon monoxide detection instrument.

4. An apparatus for detecting carbon monoxide in gas-samples containing interfering concentrations of hydrogen in admixture with said carbon monoxide which comprises a reactor comprising a non-catalytic reaction zone, inlet and outlet means to and from said reaction zone, means for heating said reaction zone to a temperature in excess of about 700° C in combination with an electrochemical carbon monoxide detection instrument, communication means between said detection instrument and the outlet of said reaction zone, means for drawing said gas sample through said reaction zone and into said detection instrument at a controlled flow rate and read out means for reading the quantity of carbon monoxide detected.

4,073,699
METHOD FOR MAKING COPPER FOIL

Irving J. Hutkin, 8983 Complex Drive, San Diego, Calif. 92123

Filed Mar. 1, 1976, Ser. No. 662,551
Int. Cl.² C25D *1/04, 1/20, 1/22*
U.S. Cl. 204—13 **12 Claims**


TREATMENT SECTION D
(BOND TREATMENT ON COPPER FOIL SURFACE)
SECTION C
(ELECTRO-DEPOSITION OF COPPER FOIL ONTO BELT)
ACTIVATING SECTION B
(BELT SURFACE PREPARATION)
CLEANING SECTION A

1. An improved method of continuously making high quality pore-free copper foil, said method comprising:
   a. moving into an operative position an endless, continuous belt, said belt comprising a metal selected from the group of stainless steel, aluminum, nickel, titanium, copper, brass, bronze, or alloys thereof, or mild steel, iron, lead or alloys thereof;
   b. electro-chemically depositing in a deposition zone a clean fresh, removable, endless, seamless and continuous plateable layer of metal selected from the group of chromium, nickel and cobalt;
   c. depositing in a deposition zone a coating of porefree copper onto said metal to form a copper foil;
   d. stripping said copper foil from said metal layer in a separation zone;
   e. chemically removing the plateable layer from said belt in a cleaning zone in a manner to substantially preserve the structural integrity of the belt; and
   f. repeating the above steps a plurality of times, whereby a continuous method for producing copper foil is provided.

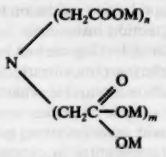
4,073,700
PROCESS FOR PRODUCING BY ELECTRODEPOSITION BRIGHT DEPOSITS OF GOLD AND ITS ALLOYS

Alfred M. Weisberg, 48 Barberry Hill, Providence, R.I. 02906, and Harry Kroll, 408 Fair St., Warwick, R.I. 02888

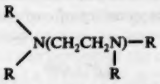
Continuation of Ser. No. 556,691, March 10, 1975, abandoned, which is a continuation of Ser. No. 425,182, Dec. 17, 1973, abandoned, which is a continuation of Ser. No. 319,157, Dec. 29, 1972, abandoned, which is a continuation of Ser. No. 166,030, July 26, 1971, abandoned. This application July 2, 1976, Ser. No. 702,041
Int. Cl.² C25D *3/48, 3/62*
U.S. Cl. 204—43 G **8 Claims**

1. In a process for producing bright gold or gold-base alloy deposits, in a pH range between 3 and 8, from an aqueous

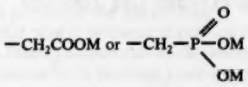
solution containing a water soluble complex of gold cyanide, the improvement comprising carrying in solution in said solution a chelating agent selected from the group consisting of those represented by the formula:



where m and n are either 1 or 2 and $m + n = 3$, and M is hydrogen or an alkali metal cation, and those represented by the formula:



where n is 1, 2, or 3 and R may be either



at least one R group being either a methylene carboxylic acid group or a methylenephosphonic acid group, and not all R's the same, and

M is hydrogen or an alkali metal cation

which process comprises electrolyzing said solution employing a metal object to be electroplated as a cathode in said electrolytic operation.

4,073,701

ACID ELECTROTINNING BATH

Richard N. Steinbicker, Coopersburg, and Stewart E. Rauch, Bethlehem, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Oct. 15, 1976, Ser. No. 732,821

Int. Cl.[2] C25D *3/32*

U.S. Cl. 204—54 R **27 Claims**

1. An improved aqueous acid halogen electrotinning bath for electrolytically depositing tin onto a steel substrate, containing bivalent tin ions, sodium fluoride, sodium chloride, stabilizing and solubilizing agents, addition agents for electrodepositing a smooth coherent layer of tin onto said substrate and at least about 0.10 grams per liter of solution of at least one acetanilide taken from the group consisting of para-aminoacetanilide and para-nitroacetanilide, said bath being characterized by having reduced susceptibility of the bivalent tin ion to oxidation to the quadrivalent tin ion.

6. An improved aqueous acid halogen electrotinning bath for electrolytically depositing tin onto steel sheet and strip containing bivalent tin ions, sodium fluoride, sodium bifluoride, sodium chloride, sodium ferrocyanide, addition agents necessary to deposit a smooth, coherent layer of tin onto said steel sheet and strip and at least about 0.10 gram per liter of solution of at least one organic ring compound containing at least one radical taken from the group consisting of the amino group, $—NH_2$, and the nitro group, $—NO_2$, in the ortho or para position, said organic ring compound taken from the group consisting of para-aminoacetanilide, para-nitroacetanilide, para-aminophenylacetic acid and 4-aminoantipyrine.

4,073,702

ELECTROCHEMICAL CELLS

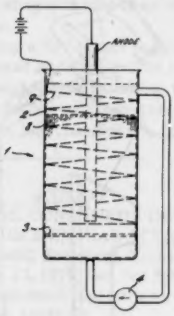
Martin Fleischmann, Eastleigh; Francis Goodridge, Newcastle-upon-Tyne, and Christopher John Vance, Jarrow, all of England, assignors to National Research Development Corporation, London, England

Filed Oct. 12, 1976, Ser. No. 731,374

Claims priority, application United Kingdom, Oct. 10, 1975, 41622/75

Int. Cl.[2] C25C *1/00, 1/12, 7/06, 7/02*

U.S. Cl. 204—59 R **11 Claims**



1. An electrochemical cell comprising a particulate electrode having a current feeder member and a mass of particles, the particles having surfaces at least some of which are electronically conductive, means for passing an electrolyte through said particulate electrode such as to expand the mass of particles at least into a fluidized bed in contact with said current feeder member and a counterelectrode in direct contact with at least some particles of said particulate electrode, the material of the surface at least of said counterelectrode being electrically conducting, but the contact resistance in air between a surface of said material and the superficial area of a copper test surface being at least about 10 times the contact resistance under the same conditions of measurement between the said area of said copper test surface and another surface of copper.

4,073,703

ELECTROLYTIC PRODUCTION OF MAGNESIUM

Donald L. Kinosz, Lower Burrell, and Warren E. Haupin, New Kensington, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

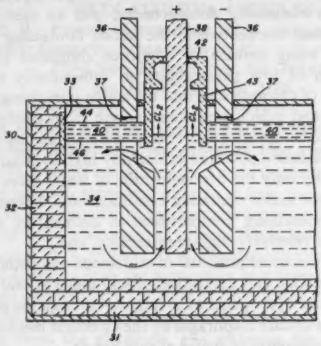
Filed Dec. 14, 1976, Ser. No. 750,506

Int. Cl.[2] C25C *3/04*

U.S. Cl. 204—70 **9 Claims**

1. An electrolytic cell having a refractory lining therein and an anode and a cathode for the production of magnesium by decomposition of molten magnesium chloride contained in an electrolyte, the magnesium produced at the cathode and chlorine at the anode, said magnesium accumulating in a layer at the surface of said molten magnesium chloride containing electrolyte, a shroud having a skirt portion thereon projecting into the electrolyte such that said chlorine produced at said anode is removed from said cell without contacting the molten magnesium layer, said shroud formed from a nitride-based refractory material selected from the group consisting of sili-

con oxynitride, silicon nitride bonded fused silica, silicon nitride and boron nitride resistant to said molten magnesium,



magnesium chloride containing electrolyte and gases emanating therefrom.

4,073,704

METHOD FOR MAGNESIUM PRODUCTION USING TUNGSTEN OR MOLYBDENUM

Alvin Francis Beale, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 8, 1976, Ser. No. 739,768
Int. Cl.² C25C *5/04, 3/04*
U.S. Cl. 204—70 **8 Claims**

1. A continuous method for the production of metallic magnesium by electrolytically decomposing magnesium chloride with a cathode and an anode in a molten salt bath comprising an alkali metal chloride and magnesium chloride the steps which comprise

A. heating and fusing the salt bath at a temperature in the range from about 660° to about 900° C.,

B. passing direct current through said bath to decompose the magnesium chloride,

maintaining a concentration of magnesium chloride in the salt bath in the range from about 5 to about 35 percent by weight by periodic additions thereof,

D. adding periodically to the salt bath sufficient amounts of an additive selected from the group consisting of inorganic salts of molybdenum, inorganic salts of tungsten, metallic molybdenum, metallic tungsten or mixtures thereof which will coat the cathode surface with said metal and thereby increase the agglomeration of molten magnesium, and

E. recovering molten magnesium from said salt bath.

4,073,705

METHOD FOR TREATING USED OR EXHAUSTED PHOTOGRAPHIC FIXING SOLUTION

Eiichi Torikai, Yao, and Youji Kawami, Kawachinagano, both of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

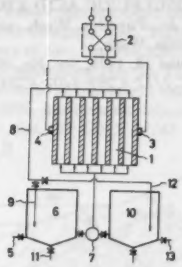
Filed Oct. 12, 1976, Ser. No. 731,687
Claims priority, application Japan, Oct. 20, 1975, 50-126749
Int. Cl.² C25B *1/00*
U.S. Cl. 204—92 **2 Claims**

1. A method for treating a used or exhausted photographic fixing solution containing silver and sulfur components in an electrolytic cell which comprises

a. electrolyzing the solution for a period of time sufficient to convert the silver component to a silver sulfide precipitate while reversing the polarity of the electrodes,

b. separating the precipitate from the solution, and

c. electrolyzing the resulting solution to lower the COD value while repeatedly reversing the polarity of the electrodes,



whereby the reversing of the polarity of the electrodes in steps (a) and (c) prevents the adherence of any colloidal silver sulfide or sulfur to the electrodes.

4,073,706

BRINE TREATMENT FOR TRACE METAL REMOVAL

Zoltan Nagy, Mentor, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Feb. 6, 1976, Ser. No. 655,691
Int. Cl.² C25B *1/16*
U.S. Cl. 204—98 **8 Claims**

1. A method for reducing the trace metals content of an aqueous alkali metal chloride solution containing less than abaout 5 ppm of magnesium followed by electrolysis of the solution, which comprises

a. adding soluble magnesium compound to the solution to establish a magnesium concentration of greater than 5 ppm,

b. precipitating the magnesium as $Mg(OH)_2$,

c. separating the precipitate containing said trace metals from the solution, and

d. electrolyzing the solution to produce chlorine and alkali metal hydroxide.

4,073,707

METHOD OF OPERATING A CIRCULATING BED CELL

Placido Maria Spaziante; Rinaldo Santi, both of Milan, Italy, and Vittorio De Nora, Nassau, Bahamas, assignors to Parel Societe Anonyme, Luxembourg

Filed Dec. 22, 1976, Ser. No. 753,228
Int. Cl.² C25C *1/00, 1/12*
U.S. Cl. 204—105 R **19 Claims**

1. A method of controlling the size distribution of electroconductive particles constituting a particulate cathode in an electrochemical cell during operation of the cell to deposit metal from solution onto the particles of the particulate cathode whereby the size of the said particles increases progressively, which method comprises extracting particles from the particulate electrode and subjecting the extracted particles to elutriation, the flow of elutriating fluid being such that particles larger than a predetermined size are able to settle against the flow of elutriating fluid, while the other particles, which are to be returned to the electrochemical cell, are carried along by the flow of elutriating fluid and are then returned to the electrochemical cell after separation from the elutriating fluid or along with the elutriating fluid.

4,073,708

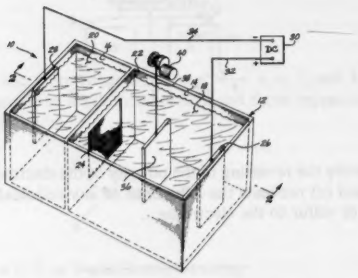
APPARATUS AND METHOD FOR REGENERATION OF CHROMOSULFURIC ACID ETCHANTS

Harry Clark Hicks, Jr., Puyallup, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed June 18, 1976, Ser. No. 697,600

Int. Cl.[2] C25C *1/12*; C25F *3/02*; C25C *7/04, 7/06*

U.S. Cl. 204—106 6 Claims



1. An apparatus having a tank for etching copper in a chromic-sulfuric etchant and for regenerating the etchant and depositing out dissolved copper within the tank, the apparatus comprising: means for dividing an etchant tank into two compartments adapted to contain an aqueous copper etching hexavalent chromic oxide-sulfuric acid etchant in an etching compartment and adapted to contain an aqueous solution consisting essentially of alkali metal sulfate or sulfuric acid in a cathode compartment, a permeable membrane communicating between the two compartments, an anodic electrode located in the etching compartment, an electrode located in the cathode compartment, means for passing an electric current between the electrodes, and means for introducing a copper containing article into the etching compartment to permit simultaneous etching of the article regeneration of the etchant and deposition of copper in the etchant tank.

4,073,709

ELECTROLYTIC RECOVERY OF NICKEL AND ZINC

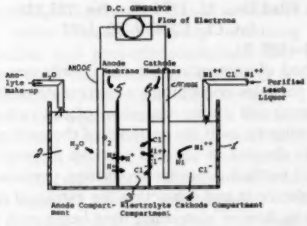
Willem Hubert Pittie, Rooderpoort, Transvaal, and Gerhardus Overbeek, Florida, Transvaal, both of South Africa, assignors to Anglo-Transvaal Consolidated Investment Company Limited, Johannesburg, South Africa

Filed Sept. 2, 1975, Ser. No. 609,812

Claims priority, application South Africa, Sept. 4, 1974, 74/5625

Int. Cl.[2] C25C *1/08, 1/16*

U.S. Cl. 204—113 9 Claims



1. A method for electrolytically recovering a metal selected from the group consisting of nickel and zinc from a solution containing nickel or zinc ions and anions, wherein the anions are substantially purely chloride, comprising:

introducing the solution into a cathode containing compartment of an electrolytic cell which is divided into three compartments, namely an anode containing compartment, a cathode containing compartment, and an electrolyte compartment therebetween, the anode containing compartment being defined by a porous aluminum silicate diaphragm of low permeability to substantially inhibit migration of chloride ions into the anode containing compartment and which separates anolyte from electrolyte, the anolyte comprising a solution containing anions which have an oxidation potential sufficiently high to ensure that substantially only the decomposition of water takes place at the anode under operating conditions and wherein the cathode containing compartment is defined by a diaphragm of relatively high permeability, and

applying an electrical potential to said anode and cathode to cause migration and deposition of said metal at said cathode, to cause hydrogen ions to migrate through the porous aluminium silicate diaphragm by the Grotthus mechanism, and decomposition of water at said anode.

4,073,710

METHOD OF MACHINING ELECTRICALLY CONDUCTING SUBSTANCES BY ELECTROCHEMICAL ATTACK

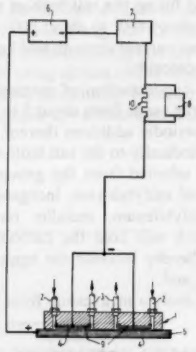
Kommer Visser, Amsterdam-Bijlmermeer, Netherlands, assignor to Ultra Centrifuge Nederland N.V., The Hague, Netherlands

Filed July 14, 1976, Ser. No. 705,174

Claims priority, application Netherlands, Aug. 11, 1975, 7509529

Int. Cl.[2] C25F *3/00, 3/02*; C25D *17/12*

U.S. Cl. 204—129.65 7 Claims



1. A method of removing material from the surface of a workpiece made of an electrically conducting substance by electrochemical attack comprising:

providing a non-conducting template in association with the workpiece and flowing a liquid electrolyte into contact with the surface of the workpiece at at least one exposed place determined by the template, the template being adapted in shape to the surface from which material is to be removed and being provided with at least one elongated channel for the afflux of the liquid at the places where an elongated recess or groove is desired in the workpiece; and passing a direct current in pulses of 5–20 milliseconds between the exposed surface of the workpiece and at least one electrode which has the form of the desired recess and which is provided in the channel in the template.

4,073,711

METHOD OF PRODUCING LITHIATED BETA-ALUMINA ARTICLES

Robert W. Powers, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 22, 1976, Ser. No. 743,633
Int. Cl.[2] C25D *1/14, 1/20*
U.S. Cl. 204—181 F 4 Claims

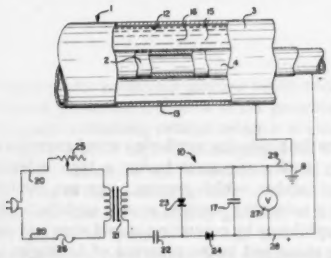
1. A method of producing a lithiated beta-alumina article comprising providing a suspension of beta-alumina particles and soda alumina particles with a soda content from 14 to 30 weight percent, providing lithia in at least one of the types of particles, the majority of the particles having a diameter in the range of 1 to 2 microns in an organic liquid having a dielectric constant at 25° C from 12 to 24, electrophoretically codepositing the particles from the suspension as a dense deposit onto a charged electrode in a DC field of from 100 to 10,000 volts per centimeter, drying the deposit on the electrode, removing the deposit from the electrode, and sintering the deposit in an oxidizing atmosphere at a temperature between 1500° and 1775° C resulting in a dense, fine-grain sintered article containing from 0.1 to 1.0 weight percent lithia.

4,073,712

ELECTROSTATIC WATER TREATMENT

Eldon A. Means, Wichita, Kans., and Roy C. McMahon, Kansas City, Mo., assignors to Electrostatic Equipment Company, Kansas City, Mo.

Filed Nov. 19, 1976, Ser. No. 743,139
Int. Cl.[2] B03C *5/00*
U.S. Cl. 204—186 30 Claims



1. A device for treating a fluid with an electrostatic field comprising:

(a) a pair of electrodes mounted in spaced relation;

(b) means for directing a fluid between said electrodes;

(c) said electrodes each having a respective dielectric covering insulating said electrodes from said fluid, said insulating covering on at least one of said electrodes being a hard anodized coating;

(d) power supply means establishing a direct current potential between said electrodes, said power supply means having a positive terminal connected to one of said electrodes and a negative terminal connected to the other electrode; and

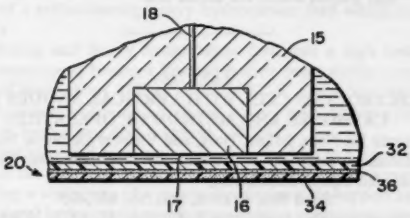
(e) said electrodes, dielectric coverings and fluid forming the equivalent of three capacitors connected in series, said electrodes being spaced apart and sized and said dielectric coverings having thicknesses and dielectric constants whereby the percentage of said potential appearing across said fluid exceeds 50%.

4,073,713

MEMBRANE FOR ENZYME ELECTRODES

David P. Newman, Yellow Springs, Ohio, assignor to The Yellow Springs Instrument Company, Inc., Yellow Springs, Ohio

Continuation-in-part of Ser. No. 616,326, Sept. 24, 1975, Pat. No. 3,979,274. This application July 26, 1976, Ser. No. 708,399
The portion of the term of this patent subsequent to Sept. 7, 1993, has been disclaimed.
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—195 B 9 Claims



1. A polarographic cell structure for use in polarographic analysis of an unknown comprising an electrically insulating support means, and electrode means mounted in said support means, said electrode means mounted in said support means, said electrode means including means defining an active exposed working face, wherein the improvement comprises:

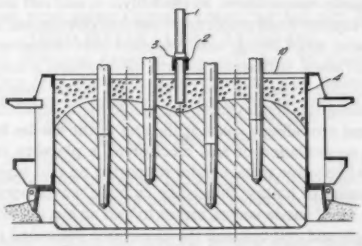
a laminated membrane of a total thickness of less than 25 microns positioned between said working face and said unknown, said membrane consisting essentially of a first layer of an essentially homogeneous material selected from the group consisting of silicone rubber, methyl methacrylate, and cellulose acetate and having a thickness of less than 2 microns, a second layer of a support material which permits passage of low molecular weight substances but excludes high molecular weight substances, said support material having a thickness of between 1 and 20 microns, and an adhesive layer positioned between and bonding said first and second layers, an enzyme being included in said adhesive layer.

4,073,714

MEANS FOR COOLING OF SELF-BAKING ANODES IN ALUMINUM ELECTROLYSIS CELLS

Finn Roed, Havik, Norway, assignor to Norsk Hydro a.s, Oslo, Norway

Filed Apr. 9, 1976, Ser. No. 675,567
Claims priority, application Norway, Apr. 10, 1975, 751257
Int. Cl.[2] C25C *3/06, 3/16, 7/00*
U.S. Cl. 204—243 R 14 Claims



1. A device for cooling a self-baking anode in an electrolysis cell for the producing of aluminum, such anode being of the type including a mantle open at the top and bottom thereof and filled with anode mix, and having first and second groups of

anode bolts extending into opposite sides of said anode mix, said device comprising:

a plurality of solid and unperforated, vertically positioned, longitudinal cooling rods; and

means for supporting said cooling rods peripherally thereof in a row extending only along a narrow band-shaped zone encompassing the longitudinal center line of the anode between the groups of anode bolts, such that a lower portion of each said cooling rod may be submerged in the anode mix and an upper portion of each said cooling rod may extend above the anode mix.

4,073,715

ELECTROLYSIS CELL WITH VERTICAL ANODES AND CATHODES AND METHOD OF OPERATION

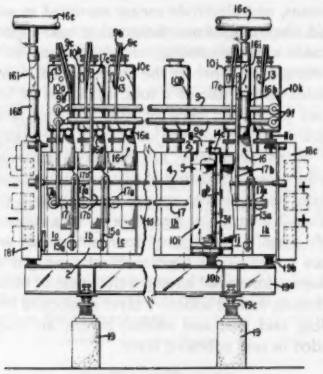
Oronzio De Nora, Milan, Italy, and Vittorio De Nora, Nassau, Bahamas, assignors to Oronzio de Nora Impianti Elettrochimici, S.p.A., Milan, Italy

Filed Feb. 5, 1976, Ser. No. 655,493

Claims priority, application Italy, Nov. 28, 1975, 29782/75

Int. Cl.[2] C25B *1/34, 9/00, 11/03*

U.S. Cl. 204—256 **30 Claims**



1. Electrolysis cell units for the electrolysis of alkali halide brines, having an anode compartment and a cathode compartment therein, a metal separating partition between each said cell unit and the next adjacent cell unit, comprising a ferrous metal in the cathode compartment and a valve metal in the anode compartment, a metal frame around said anode and cathode compartments, a continuous, imperforate valve metal lining in the anode compartment of said frame and on said separating partition, resistant to the corrosive conditions in said anode compartment, an electrolyte in said cell units, valve metal support studs projecting from said continuous, imperforate valve metal lining, anode support bars connected to said support studs, said anode support bars forming a substantially imperforate separating wall within said anode compartments, separating the anodes from said valve metal separating partition and providing a space at the rear of the anodes for downward recirculation of said electrolyte, a plurality of hollow finger-like valve metal anodes supported on said support bars, a plurality of hollow finger-like cathode waves between said valve metal anode waves, means to pass an electrolysis current through said cell unit and the electrolyte contained therein to circulate said electrolyte upward along both the front and in the interior of said anode waves by the gas lift effect of the gases formed in the electrolysis, and downward behind said anodes, means to collect anodic gases produced in said cell unit and means to collect cathodic gases and cathode liquor produced in said cell unit.

4,073,716

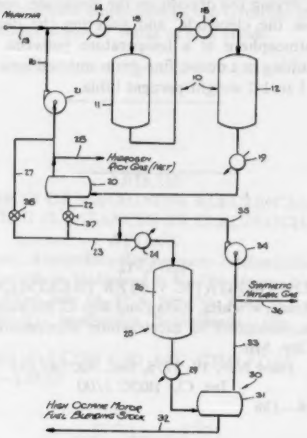
PROCESS FOR PRODUCING SYNTHETIC NATURAL GAS AND HIGH OCTANE MOTOR FUEL COMPONENTS

William C. Pfefferle, Middletown, and William P. Hettinger, Jr., Mountainside, both of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Iselin, N.J.

Filed Nov. 7, 1975, Ser. No. 629,858

Int. Cl.[2] C10G *13/30, 39/00*

U.S. Cl. 208—66 **9 Claims**



1. A process for producing synthetic natural gas and a motor fuel blending stock component having a high unleaded research octane number, which process comprises catalytically reforming in a reforming reaction zone a naphtha feed-stock containing naphthenes by contacting in said zone said naphtha in the vapor phase and in the presence of hydrogen with a reforming catalyst at low severity reforming conditions selected to maximize the formation of aromatics by dehydrogenation of naphthenes and to minimize hydrocracking of components of said feed-stock; cooling the effluent from said reaction zone and separating said effluent in a first separation zone into a hydrogen-rich gas stream and a liquid low octane reformate, said reformate comprising predominantly aromatics and paraffins and less than about 10% naphthenes, and having an octane number of less than about 95; introducing said reformate into a methanation zone for conversion of non-aromatic hydrocarbons to methane and into contact with a methanation catalyst in the presence of hydrogen, and separating in a second separation zone the effluent from said methanation zone into only two streams, said streams being a high octane motor fuel blending stock component comprising predominantly aromatics and having a higher percentage of aromatics than in said low octane reformate and a synthetic natural gas stream comprising essentially, on a carbon dioxide-free basis, methane and less than about 5% hydrocarbons having more than one carbon atom per molecule, and not more than 10% hydrogen.

4,073,717

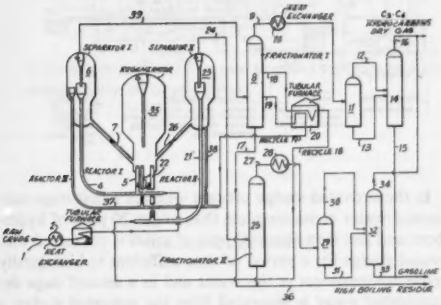
PROCESS FOR PRODUCING GASOLINE

Vagab Safarovich Aliev, ulitsa Nizami, 66, kv. 40, Baku; Georgy Georgievich Markarian, Teply stan, 5 mikroraion, korpus 65, kv. 230, Moscow; Musa Ismail ogly Rustamov, ulitsa Gadzhibekova, 16, kv. 3; Evgeny Ivanovich Pryanikov, prospekt Kirova, 65, kv. 17, both of Baku, all of U.S.S.R.; Rustam Gadzhi Ali ogly Ismailova, deceased, late of Baku, U.S.S.R.; Amina Kyazim Kyzy Ismailov, administrator, 1 Chkalovsky pereulok, 7, kv. 8, Baku, U.S.S.R.; by Ali Rustam ogly Ismailova, administrator, 1 Chkalovsky pereulok, 7, kv. 8, Baku, U.S.S.R.; by Dzhulietta Rustamovna Ismailova, administrator, 6 Kommunistichesky pereulok, 10, Baku, U.S.S.R., and by Zhanna Rustamovna Kulieva, administrator, Erevansky pereulok, 2, Baku, U.S.S.R.

Filed Jan. 26, 1976, Ser. No. 652,578

Int. Cl.[2] C10G *11/04;* B01J *8/24, 29/12*

U.S. Cl. 208—74 2 Claims



1. A process for producing gasoline which comprises cracking a heavy petroleum feedstock in the presence of aluminosilicate zeolite-containing catalyst which is in a condition of an ascending flow at a temperature ranging from 480° to 520° C and at a mass velocity of said feedstock of from 6 to 40 hr^{-1} in the direction of said ascending flow with the formation of a first reaction mixture containing gasoline, a fraction with a specific gravity of from 0.75 to 0.85 and a fraction with a specific gravity of from 0.85 to 0.95; separating said first reaction mixture from the catalyst and separating from said first reaction mixture a fraction A with a specific gravity of from 0.75 to 0.85 and a fraction B with a specific gravity of from 0.85 to 0.95; cracking said fraction A in the presence of said catalyst which is in a condition of an ascending flow at a temperature of from 460° to 520° C and at a mass velocity of said fraction A of from 6 to 40 hr^{-1} in the direction of said ascending flow with the formation of a second reaction mixture containing gasoline; separating said second reaction mixture from the catalyst; recovering gasoline from said second reaction mixture; cracking said fraction B in the presence of said catalyst which is in a condition of an ascending flow at a temperature of from 460° to 520° C and at a mass velocity of said fraction B selected within the range of from 5 to 8 hr^{-1} with the formation of a third reaction mixture containing gasoline and a fraction C with a specific gravity of from 0.85 to 0.95; and combining fraction C with said first reaction mixture; whereby concentration of the catalyst is increased in the direction of the feedstock stream, due to effecting cracking at a diminishing mass velocity of the feedstock stream.

4,073,718

PROCESS FOR THE HYDROCONVERSION AND HYDRODESULFURIZATION OF HEAVY FEEDS AND RESIDUA

Glen P. Hamner, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 685,500, May 12, 1976, Pat. No. 4,051,021. This application Oct. 18, 1976, Ser. No. 733,717

Int. Cl.[2] C10G *13/06, 39/00;* B01J *8/24*

U.S. Cl. 208—80 26 Claims

1. A process for the hydroconversion and hydrodesulfurization of a sulfur-bearing heavy hydrocarbon feed which comprises

splitting said heavy hydrocarbon feed into a high boiling component having a low end boiling point within a range of from about 850° to about 1100° F, and a low boiling component having a high end boiling point within a range of from about 850° to about 1100° F,

contacting said high boiling component feed in a first stage, in the presence of added hydrogen, with catalyst comprising a composite of a porous inorganic oxide support and a metal hydrogenation-dehydrogenation component constituted of from about 5 to about 30 percent of a Group VIB metal, or compound thereof, and from about 1 to about 12 percent of a Group VIII metal, or compound thereof, or admixture of said Group VIB and VIII metals or compounds thereof, said catalyst composite comprising greater than 50 percent of its total pore volume of absolute diameter within the range of from about 70A to about 200A, to convert at least about 30 percent by weight of the 1050° F+ hydrocarbons to 1050° F− hydrocarbons,

separating hydrogen, light ends and by-product hydrogen sulfide from the effluent, and separating therefrom a product having a high end boiling point ranging from about 850° to about 1100° F,

blending said product of high end boiling point with the low boiling component split from the original heavy hydrocarbon feed, and then

contacting said blended low boiling material in a second stage with catalyst comprising a composite of a porous inorganic oxide support and a metal hydrogenation-dehydrogenation component constituted of from about 5 to about 30 percent of a Group VIB metal, or compound thereof, and from about 1 to about 12 percent of a Group VIII metal, or admixture of said Group VIB and VIII metals or compounds thereof, said catalyst composite comprising greater than 50 percent of its total pore volume of absolute diameter ranging from about 50A to about 120A, at severity sufficient to desulfurize from about 80 to about 99 percent of the blended low boiling materials, based on the weight of the liquid introduced as feed to said second desulfurization stage.

4,073,719

PROCESS FOR PREPARING LUBRICATING OIL FROM USED WASTE LUBRICATING OIL

Marvin L. Whisman; James W. Reynolds; John W. Goetzinger, and Faye O. Cotton, all of Bartlesville, Okla., assignors to United States Department of Energy, Washington, D.C.

Filed Apr. 26, 1977, Ser. No. 791,076

Int. Cl.[2] C10M *11/00*

U.S. Cl. 208—180 14 Claims

1. A process for preparing lubricating oils from used waste lubricating oils containing additives, oxidation products and the like comprising:

a. vacuum-distilling the used oil to strip water and volatile materials boiling below 600°–700° F;

b. mixing the stripped oil with a solvent consisting of about 1 part 2-propanol, about part 1 methylethyl ketone and about 2 parts 1-butanol, whereby the oil dissolves in the solvent and the additives, oxidation products and the like precipitate out as a sludge forming a partially purified oil;

c. separating the partially purified oil-solvent mixture from the sludge;
d. separating the partially purified oil from the solvent solution;
e. vacuum-distilling the partially purified oil and collecting the distillate overhead boiling from about 700° to about 1000° F, thereby forming a lubricating oil distillate;
f. decolorizing and deodorizing the lubricating oil distillate, thereby forming a lubricating oil base; and
g. mixing the lubricating oil base with appropriate additives and viscosity index improvers to form a finished lubricating oil.

4,073,720

METHOD FOR RECLAIMING WASTE LUBRICATING OILS

Marvin L. Whisman; John W. Goetzinger, and Faye O. Cotton, all of Bartlesville, Okla., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 22, 1976, Ser. No. 734,838
Int. Cl.[2] C10M *11/00*
U.S. Cl. 208—180 6 Claims

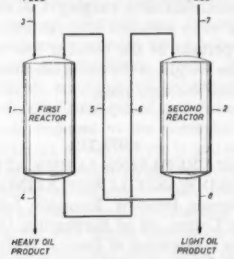
1. In a process for reclaiming used lubricating oil wherein the oil is stripped of water and volatile constituents and subsequently subjected to conventional lubricating oil refining steps, the improvement which comprises removal of sludge components of the used oil by contacting the oil with a solvent mixture consisting of about 1 part 2-propanol, about 1 part methyl ethyl ketone and about 2 parts 1-butanol following the stripping step and prior to the conventional refining steps whereby the oil dissolves in the solvent and the sludge components precipitate out.

4,073,721

CATALYST REGENERATION BY CIRCULATING CATALYST IN A HYDROTREATING OIL PROCESS

Dirk Kanbier, The Hague, and Frans Goudriaan, Amsterdam, both of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed June 23, 1977, Ser. No. 809,256
Claims priority, application United Kingdom, July 6, 1976, 28067/76
Int. Cl.[2] C10G *23/08*
U.S. Cl. 208—251 H 6 Claims



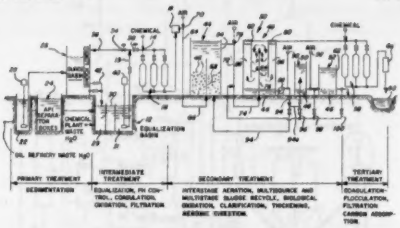
1. A process for hydrotreating (1) a light mineral hydrocarbon oil feed having an atmospheric final boiling point less than 371° C and a measurable Conradson Carbon residue, and (2) a heavy mineral hydrocarbon oil feed at least part of which has an atmospheric boiling point above 371° C, and having a Conradson Carbon residue at least twice that of said light oil feed, which process comprises:
(a) contacting said heavy oil in a first reactor and said light oil in a second reactor at an elevated temperature and pressure with hydrogen and with a hydrotreating catalyst
(b) separating a heavy oil product of lower metal content than said heavy oil feed from said first reactor and a light oil product from said second reactor, and
(c) circulating regenerated catalyst from the bottom of said second reactor to the top of said first reactor and at least partly deactivated catalyst from the bottom of said first reactor to the top of said second reactor.

4,073,722

PROCESS FOR THE PURIFICATION OF WASTE WATER

James F. Grutsch, Hammond; Russell C. Mallatt, Crown Point, both of Ind., and Benjamin F. Steely, Chicago Heights, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 401,652, Sept. 28, 1973, abandoned. This application Feb. 12, 1976, Ser. No. 657,497
Int. Cl.[2] C02C *1/06*
U.S. Cl. 210—5 74 Claims



1. In the activated sludge process wherein a first stage contaminated water containing less than about 20 ppm of hydrocarbons and less than about 20 ppm of solids is contacted with activated sludge for a period of time sufficient to biologically degrade contaminents in the water and in a second stage decontaminated water is separated from the activated sludge, a first portion of said separated sludge being recycled for recontact with the water in the first stage and a second portion of said separated sludge being treated in downstream operations, the improvement comprising:
introducing oxygen into the water and sludge mix entering the second stage so that the sludge in the second zone is maintained in an aerobic state and separated decontaminated water from said second stage contains at least about 3 parts of dissolved oxygen per million parts of water.

4,073,723

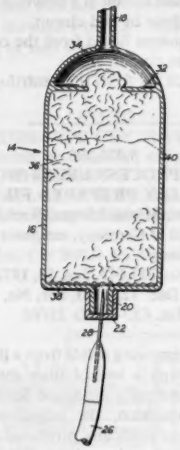
ANTI-COAGULATING AND FILTERING BLOOD

Roy L. Swank, 2211 S.W. 1st, Portland, Oreg. 97201, and David Danon, 16 Henkin St., Rehovot, Israel

Filed Nov. 15, 1976, Ser. No. 741,553
Int. Cl.[2] B01D *13/00*
U.S. Cl. 210—23 R 23 Claims

1. The method of treating blood which comprises
(a) soaking in an aqueous solution of heparin at least one filamentous material of the class consisting of filamentous polyester resin, polyamide resin, polyacrylic resin, glass, steel, cotton and cellulose,
(b) draining the excess heparin solution from the filamentous material,
(c) drying the filamentous material, whereby the dry heparin forms a coating on the surface of the filamentous material,
(d) the heparin concentration of the aqueous solution and the soaking time of the filamentous material therein being chosen so that the amount of dry heparin coating is from about 0.00025 to about 0.0025 percent, dry weight basis,

(e) and thereafter passing blood through a fluffed mass of a blood anti-coagulating quantity of said heparin-coated



filamentous material at a rate to effect anti-coagulation of substantially all of said blood.

4,073,724

ANISOTROPIC PHENOLIC POLYETHER MEMBRANE

Robert Chapurlat, Ecully, France, assignor to Rhone-Poulenc, S.A., Paris, France

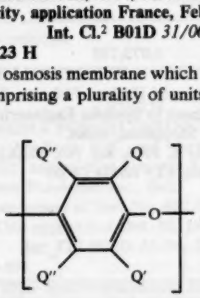
Filed Feb. 22, 1974, Ser. No. 445,287

Claims priority, application France, Feb. 27, 1973, 73 06869

Int. Cl.² B01D *31/00*

U.S. Cl. 210—23 H **10 Claims**

1. A reverse osmosis membrane which consists essentially of a polymer comprising a plurality of units of the formula:



(I)

in which each of the symbols Q, Q' and Q'', which can be identical or different, represents a hydrogen atom, an alkyl radical with 1 to 4 carbon atoms or a $—SO_3H$ radical, the number of $—SO_3H$ radicals in the polymer being such that the ionic capacity of the polymer is from about 0.5 to about 5 meq/g, in the form of a layer which exhibits a degree of salt rejection, said layer having an equivalent thickness of from about 0.01 to about 5 μ, and a highly porous support layer, of thickness up to about 1 mm.

4,073,725

METHOD AND APPARATUS FOR LIQUID CHROMATOGRAPHY UNDER ELEVATED PRESSURE

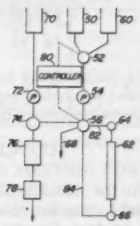
Seiji Takeuchi, Hitachiota; Kazunori Fujita, Ibaraki, and Ikuo Shimokobe, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 23, 1976, Ser. No. 679,750

Claims priority, application Japan, May 9, 1975, 50-54466; May 19, 1975, 50-58515

Int. Cl.² B01D *15/08*

U.S. Cl. 210—31 C **15 Claims**



1. A method for liquid chromatography for high pressure separation, which comprises:

feeding a sample to be separated to components to a separation column packed with an ion exchange resin deformable under pressure,

feeding an eluting solution containing counter ions to the separation column,

detecting a plurality of the components leaving the separation column, and

feeding a regenerating solution containing metal ions having the same electric charge as that of the counter ions and a larger hydration number than that of the counter ions to the separation column to regenerate the ion exchange resin.

4,073,726

REMOVAL OF TRINITROTOLUENE FROM AQUEOUS MEDIA

Yoshiyuki Okamoto, Fort Lee, N.J.; Joseph Y. Wang, Alkhart, Ind., and Eng J. Chou, Sunnyside, N.Y., assignors to Polytechnic Institute of New York, Brooklyn, N.Y.

Filed Oct. 18, 1976, Ser. No. 733,707

Int. Cl.² C02B *1/20*

U.S. Cl. 210—45 **12 Claims**

1. A process for the treatment of waste water from the manufacture of trinitrotoluene, said process comprising:

a. forming an admixture of (i) waste water comprising an aqueous solution of trinitrotoluene and (ii) an amino group containing compound of the formula

$$(C_nH_{2n+1})_m(NH(CH_2)_x)_yNH_z$$

wherein n is 1 to 25, m is 1 to 3, x is 1 to 5, y is 0 to 5, z is 0 to 2, alone or with a cationic compound of the formula

$$(C_nH_{2n+1})_4N^+X^-$$

wherein n is 1 to 25, and X^- is Cl^-, Br^-, SO_4H^-;

b. stirring the mixture to form a water insoluble reaction product of trinitrotoluene, and

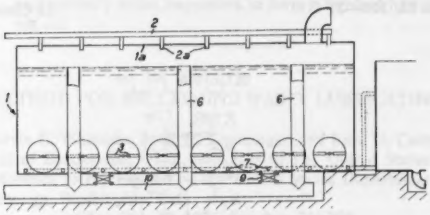
c. recovering the water insoluble reaction product from the waste water.

4,073,727

PROCESS FOR THE OXIDATION OF WASTE LIQUORS ARISING FROM THE MANUFACTURE OF PAPER PULP

Yves G. Garrigues, Rueil-Malmaison, France, assignor to Groupement Europeen de la Cellulose, Paris, France

Filed Mar. 20, 1974, Ser. No. 453,046
Claims priority, application France, Mar. 28, 1973, 73.11209
Int. Cl.[2] C02B *1/34*
U.S. Cl. 210—63 R 5 Claims



1. In a process for the oxidation of an aqueous liquor containing caustic soda and sodium sulphide arising from the manufacture of paper pulp, the improvement which comprises: oxidizing the liquor in a reservoir in which are located horizontally disposed candles of a sintered material through which air for oxidation is blown, the air for oxidation being introduced into the candles at about 90° C and oxidation being carried out at a temperature of from 70° to 90° C.

4,073,728

PROCESS FOR TREATING FLUSHING LIQUOR

Hansjürgen Ullrich; Heinz Dippel, and Karl Loss, all of Bochum, Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Filed Dec. 27, 1976, Ser. No. 754,502
Claims priority, application Germany, Dec. 27, 1975, 2558857
Int. Cl.[2] B01D *35/18;* C02B *1/02*
U.S. Cl. 210—71 7 Claims

1. A process for treating flushing liquor discharged from a gas main of a coke oven to obtain an aqueous liquid substantially free of tar and solids suitable for reuse as flushing liquid in the gas main and to obtain tar having a low water and solids content, said process including the steps of:

separating said flushing liquor in a preliminary gravity separator into an aqueous liquid phase substantially free of tar and solids and into a tar phase,

using said aqueous liquid phase for washing gases in said gas main of a coke oven,

feeding said tar phase into a circuit forming a closed loop which includes a pump and a centrifuge for three-phase clarification and separation, the circulation in said circuit being at a flow rate greater than that of said tar phase which is introduced from said preliminary gravity separator said flow rate being sufficient to provide substantially constant operating conditions within said process and said circuit functioning to provide three-phase separation of said tar phase,

withdrawing clean tar which is substantially free from contaminants, from said circuit at a flowrate less than the flow rate of said tar phase in said circuit,

withdrawing an aqueous liquid from the centrifuge for subsequent use in the circuit, and

withdrawing a thick tar from the centrifuge out of the circuit.

4,073,729

FILTERING PROCESS USING INORGANIC SYNTHETICALLY PREPARED FILTER SAND

Stefan Kraemer, Essen; Michael Seger, Krefeld-Linn, and Alois Seidl, Thurnstein, all of Germany, assignors to Wasag-Chemie AG, Munich, Germany

Continuation of Ser. No. 217,643, Jan. 13, 1972, abandoned. This application Dec. 12, 1973, Ser. No. 426,617
Int. Cl.[2] B01D *23/16*
U.S. Cl. 210—80 9 Claims

1. In a process for removing solids from a liquid wherein said liquid is passed through a bed of filter media consisting of discrete, inorganic, artifically produced filter sand having the same chemical composition, the improvement comprising passing said liquid over artifically produced filter sand having grain densities of between about 1.0 and 2.2 grams per cubic centimeter, and grain diameters of between about 0.3 and 10 mm, wherein the grain density decreases with increasing grain diameter, backwashing said artifically produced filter sand and settling said artifically produced filter sand with sand grain diameters distributed from the largest to the smallest in the direction of liquid passage, said discrete, inorganic artifically produced filter sand consists essentially of a preliminary product mixed with a powder selected from the group consisting of amorphous particles, crystalline materials, and mixtures thereof, granulated with addition of water, dried, expanded at a temperature up to about 400° C, melting the outside at a temperature of about 700° C, and cooling to form spheres, said preliminary product produced by:

(a) forming a solution containing in parts by weight about 1 part sodium silicate, having a molar ratio of $Na_2O:SiO_2$ of 1:2.5 to 1:4.5, 0.02 parts to 0.8 parts of inorganic fibrous silicate or finely powdered silicate and 2–10 parts of water;

(b) adding means for producing foaming gas to the solution; and

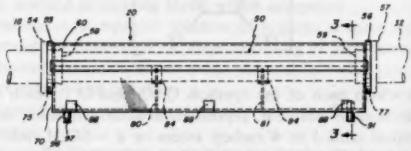
(c) heating the solution to about 140° - 360° C to drive off any free water phase.

4,073,730

ULTRAFILTRATION WATER COLLECTOR

Jacob Shorr, Lexington, and Herbert Fishman, Newton Center, both of Mass., assignors to Systems Engineering & Manufacturing Corporation, Stoughton, Mass.

Filed July 8, 1976, Ser. No. 703,625
Int. Cl.[2] B01D *13/00*
U.S. Cl. 210—321 R 8 Claims



1. An ultrafiltration purified water collector comprising:

a box for completely enclosing an ultrafiltration filter unit and having a separable section,

a first drain having an inlet elevated a distance above the bottom of said box,

a second drain having an inlet located below the level of said first drain inlet,

an entrance port through which a conduit carrying wastewater passes into said box,

and an exit port through which a conduit carrying wastewater passes out of said box.

4,073,731
PUSH-TYPE CENTRIFUGE

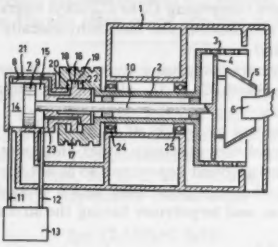
Peter Fanta, Schlieren, Switzerland, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed Oct. 13, 1976, Ser. No. 732,053

Claims priority, application Switzerland, Oct. 21, 1975, 13602/75

Int. Cl.² B01D *33/10, 35/16*

U.S. Cl. 210—376 3 Claims



1. In a push-type centrifuge having a stationary housing; a rotor comprising a shaft, a centrifuging drum and a push plate; and a double-acting fluid pressure operated push motor which is coaxial with the rotor and has a cylinder which is fixed to the housing and contains opposed working spaces, and a piston which is connected and rotates with the push plate and moves the latter forward or backward depending upon which of the working spaces is subjected to the higher pressure, and wherein the cylinder and the shaft are subjected to axial forces which act in opposite directions as the push plate is moved; the improvement which comprises a double-acting axial bearing which is positioned and reacts between the cylinder and the shaft and serves to apply directly to the cylinder and the shaft, respectively, said axial forces acting on the shaft and cylinder, said axial forces counteracting each other directly through the axial bearing so that the load on the housing attributable to those forces is reduced.

4,073,732
MEDIA FOR FILTERING BLOOD

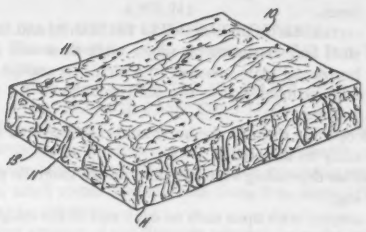
William Lauer, Madison, N.J., and Herman Charles Mouwen, Ventura, Calif., assignors to Johnson & Johnson, New Brunswick, N.J. and Purolator, Inc., Del.

Continuation-in-part of Ser. No. 462,453, April 19, 1974, abandoned. This application Oct. 10, 1975, Ser. No. 621,262

Int. Cl.² B01D *25/04, 25/16*

U.S. Cl. 210—491 4 Claims

1. A blood filter media comprising in combination the elements of an upstream filter sheet of a woven synthetic fiber fabric having a pore size of about 180 microns, a first downstream filter sheet of a layer of polyester or polyamide fibers, said layer having a thickness of at least 0.015 inch and a pore opening size in the range of from 8 - 38 microns, said layer consisting of fibers locked in position by the frictional entanglement of fibers with each other, such that said layer maintains said pore opening size range while uniformly filtering blood during extended use, and a second further downstream filter sheet of a woven synthetic fiber fabric having a pore size of about 20 microns, and the elements of said combination being co-operative to produce an efficiency of 100% in the



removal of particles of size greater than 16 microns in the filtration of at least five pints of blood.

4,073,733
PVA MEMBRANE AND METHOD FOR PREPARING THE SAME

Kazuhisa Yamauchi, Kurashiki; Koichi Takakura, Okayama; Syuji Kawai, and Akio Ohmori, both of Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Apr. 22, 1976, Ser. No. 679,441

Claims priority, application Japan, Apr. 22, 1975, 50-48995

Int. Cl.² B01D *31/00*

U.S. Cl. 210—500 M 16 Claims

1. A polyvinyl alcohol membrane prepared by the process which comprises:

extruding an aqueous PVA polymer composition containing a polyalkylene glycol having an average molecular weight of 600 to 3,000 and a carbon-to-oxygen atom ratio of not more than 3 in a proportion of 15 to 150 part by weight per 100 parts by weight of PVA, wherein said composition satisfies the relationship: $0.65 \leqq CBR \leqq 1.0$; wherein CBR is defined as the critical blending ratio onto a coagulation bath and

coagulating the extruded composition such that a resultant shaped article is formed.

4,073,734
MARINE SEPARATOR

Neely E. Lowrie, Tulsa, Okla., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Aug. 25, 1976, Ser. No. 717,793

Int. Cl.² B01D *21/10*

U.S. Cl. 210—532 R 4 Claims

1. A separator structure for the fluids of oil well production adapted to be mounted in a marine environment, including,

a marine platform located where it will be subject to wave action which will pitch and roll the marine structure,

a shell in the form of a horizontally extended cylinder and mounted on the marine platform to pitch and roll with the marine platform,

a source of oil well production at the location of the marine platform,

an inlet through one end of the shell and connected to the source to direct production from the source into the shell,

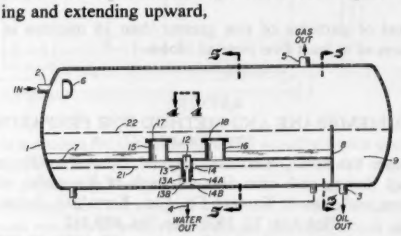
a plate member mounted within the shell to extend horizontally and parallel the longitudinal axis of the shell from the inlet end of the shell and beneath the inlet to divide a substantial length of the shell into upper and lower volumes,

a vertical baffle plate sealed to the bottom and sides of the shell and extending its upper edge as a weir above the horizontal plate member to which it is sealejd to form a compartment below the horizontal plate for the lower volume,

an opening through the horizontal plate member at substantially its midpoint,

baffles depending vertically downward from the plate opening,

a conduit with open ends on each side of the midpoint opening and extending upward,



a first outlet through the shell wall and from the compartment below the plate member,

and a second outlet through the lower portion of the shell wall and beyond the vertical baffle plate,

whereby, as the shell is pitched, the plate member receives all of the mixed liquids of the production on its upper surface, the heavier of the liquids flowing through the midpoint opening of the plate member and the interface between the liquids which is formed beneath the plate member while lighter liquids carried beneath the plate member return up through the conduits on each side of the opening and over the weir of the vertical baffle plate to the second outlet while the heavier liquids flow to the first outlet to complete the separation during pitching of the shell.

4,073,735

RINSE CYCLE FABRIC SOFTENER

Pallassana Ramachandran, Robinsville, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

Filed Feb. 19, 1976, Ser. No. 659,603
Int. Cl.[2] D06M *13/34*
U.S. Cl. 252—8.8 **11 Claims**

1. A fabric-softening composition especially effective in the rinse cycle for reducing fabric discoloration consisting essentially of cationic softener and alkali metal silicate in the weight ratio of 4:3 to 4:1 of cationic:silicate, said silicate having an Na_2O to SiO_2 ratio of from 1:1.6 to 1:3.2.

4,073,736

METAL WORKING COMPOSITIONS

John W. Schick, Cherry Hill, and Robert H. Davis, Pitman, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 559,103, March 17, 1975, abandoned. This application Oct. 20, 1976, Ser. No. 734,215
Int. Cl.[2] C10M *3/06, 1/38, 3/32, 5/28*
U.S. Cl. 252—31 **13 Claims**

1. A metalworking composition which comprises: (1) a base lubricant selected from the group consisting of mineral oils, synthetic oils and greases thereof; (2) an antiwear amount of a polypropylene glycol and sulfur; (3) a solubility improving amount of a monohydric alcohol of the formula R—OH where R is an alkyl or alkenyl group of from 5 to 30 carbon atoms.

4,073,737

HYDROGENATED COPOLYMERS OF CONJUGATED DIENES AND WHEN DESIRED A VINYL AROMATIC MONOMER ARE USEFUL AS OIL ADDITIVES

Robert L. Elliott, Scotch Plains, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Apr. 19, 1976, Ser. No. 678,144
Int. Cl.[2] C10M *1/32*
U.S. Cl. 252—51.5 A **11 Claims**

1. In a lubricating oil composition comprising:

a. a major amount of a mineral lubricating oil; and

b. a minor but effective pour point depressing amount of a polymeric pour point depressant for said oil selected from the group consisting of

i. long chain C_{15} to C_{60} alkyl aromatics wherein the aromatic may be a hydrocarbon or a hydroxy substituted hydrocarbon said aromatic containing a maximum of three said substituent groups, condensed rings, and mixtures thereof;

ii. polymers comprising C_8 to C_{20} alkyl esters of C_3 to C_8 mono- and dicarboxylic monoethylenically unsaturated acids; and

iii. copolymers comprising styrene and maleic anhydride esterfied with C_2 to C_{26} alcohol; the improvement of including

c. 0.1–10 percent by weight of an oil soluble hydrogenated block terpolymer viscosity index improver compatible with said pour point depressant, so as not to unduly interfere with the pour depressing action of said pour point depressant, said terpolymer having the structure

$$(A)_x(B)_y(C)_z$$

wherein:

A is a conjugated diene of the formula

$$CH_2=CH-\underset{\displaystyle R}{\underset{|}{C}}=CH_2$$

wherein R is a C_1 to C_8 alkyl group and present in mole % proportion as indicated by *x* which may vary from 45 to 99 mole %;

B is butadiene and present in mole % proportion as indicated by *y* which may vary from about 2 to about 9 mole %; and,

C is a C_8 to C_{20} monovinyl aromatic hydrocarbon monomer, and present in mole % proportion as indicated by *z* which may vary from 5 to 40 mole %; said block terpolymer being prepared by copolymerizing A and B to form a first block, and then copolymerizing C to form a second block and wherein about 75 to 95% of the diene monomers are in the 1,4-configuration.

4,073,738

LUBRICATING OIL COMPOSITIONS CONTAINING ALKYL ACRYLATE OR METHACRYLATE POLYMERS AND COPOLYMERS OF STYRENE AND CONJUGATED DIENE

Volker Ladenberger, Schwetzingen; Klaus Bronstert, Carlsberg; Friedrich Hovemann, Hockenheim, and Petr Simak, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Jan. 11, 1977, Ser. No. 758,435
Claims priority, application Germany, Jan. 28, 1976, 2603034
Int. Cl.[2] C10M *1/28, 1/18*
U.S. Cl. 252—56 R **2 Claims**

1. A mineral lubricating oil composition containing

(a) a predominant proportion by weight of mineral lubricating oil,

(b) from 0.05 to 2.5% by weight, based on the mineral lubricating oil, of a pour point depressant based on an alkyl acrylate or alkyl methacrylate polymer and

(c) from 0.5 to 6% by weight, based on the mineral lubricat-

ing oil, of a selectively hydrogenated, random butadiene-styrene copolymer comprising from 35 to 45% by weight of styrene units and from 65 to 55% by weight of hydrogenated butadiene units, which copolymer, prior to hydrogenation, has a 1,2-vinyl content of the polymerized butadiene units of from 23 to 40% by weight, based on copolymerized butadiene units, and which has a ^{13}C-NMR spectrum in which the ratio of the sum of the intensities of the signals of the CH_2 groups in the β-position and the CH_2 groups of the ethyl branches, ΣCH_2 (β + ethyl), to the sum of the intensities of the signals of the γ-CH_2 and δ-CH_2 carbon atoms and CH_2 carbon atoms more remote from the branch points, ΣCH_2 (γ, δ and more remote), is from 1:1 to 1:1.4, and has an IR spectrum in which the ratio of the extinctions, E, of the styrene bands at 1,180 cm^{-1} and 1,150 cm^{-1}, E(1,180)/E(1,150), is from 0.6 to 0.73 and the ratio of the extinctions, E, of the styrene bands at 1,190 cm^{-1} and 1,180 cm^{-1}, E(1,190)/E(1,180), is from 0.15 to 0.22, and in which the content of olefinic double bonds has been reduced to a residual proportion of less than 5% as a result of the selective hydrogenation.

4,073,739

TONER POWDER FOR ELECTROSTATIC IMAGES COMPRISING EPOXY RESIN

Martinus T. J. Peters, Venlo, Netherlands, assignor to Oce-van der Grinten, N.V., Venlo, Netherlands

Filed Nov. 24, 1975, Ser. No. 634,777
Claims priority, application Netherlands, Nov. 25, 1974, 7415325
Int. Cl.[2] G03G 9/08
U.S. Cl. 252—62.1 P 9 Claims

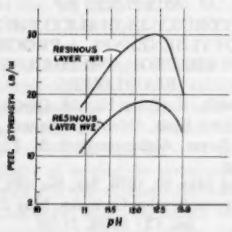
1. Toner powder for the development of electrostatic images, the individual particles of which comprise thermoplastic resin consisting essentially of epoxy resin and organic dye that in itself is insoluble in the epoxy resin, characterized in that said particles contain in an amount enhancing dissolution of said dye in said resin at least one substance selected from the group consisting of complete esters and alkyl and aryl amides of o- and m-phthalic acid, carbonic acid, phosphoric acid, benzoic acid and benzenesulphonic acids and condensation products of formaldehyde with alkyl, cycloalkyl and aryl amides of benzenesulphonic acids.

4,073,740

COMPOSITION FOR THE ACTIVATION OF RESINOUS BODIES FOR ADHERENT METALLIZATION

Joseph Polichette, South Farmingdale; Edward J. Leech, Oyster Bay, and John G. Branigan, Smithtown, all of N.Y., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Division of Ser. No. 587,831, June 18, 1975, Pat. No. 4,042,729, which is a division of Ser. No. 314,748, Dec. 13, 1972, abandoned. This application Feb. 28, 1977, Ser. No. 772,820
Int. Cl.[2] C11D 7/06, 7/12
U.S. Cl. 252—156 12 Claims



1. A stable, readily disposable composition for treating a resinous surface to receive an adherent deposit of electrolessly formed metal, said composition comprising water, permanganate ion and manganate ion in the molar ratio of manganate ion to permanganate ion of up to 1.2, said composition having a pH in the range of 11 to 13.

4,073,741

COBALT OXIDE CHLORATE CANDLE

Clifford E. Heintz, Buffalo, N.Y., assignor to A-T-O Inc., Willoughby, Ohio

Filed Mar. 5, 1976, Ser. No. 664,279
Int. Cl.[2] A62B 21/00; C01B 13/02
U.S. Cl. 252—187 R 18 Claims

1. A substantially fuel-free oxygen-generating candle comprising a compressed active oxygen source consisting essentially of an alkali metal chlorate with from 0 to about 1% of alkali metal perchlorate;

a sufficient amount of cobalt oxide selected from the group consisting of CoO and mixtures of CoO and Co_3O_4 to maintain a self-sustaining catalytic decomposition admixed therewith;

said mixture being substantially fuel-free; and

an ignition material on an end of the candle whereby when ignited the candle generates oxygen by relatively low temperature catalytic decomposition of the chlorate.

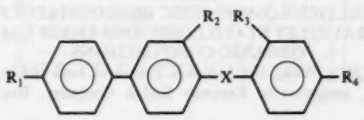
4,073,742

CYANO-SUBSTITUTED BIPHENYL COMPOUNDS AND LIQUID CRYSTALLINE DIELECTRICS CONTAINING THE SAME

Dietrich Erdmann; Rudolf Eidenschink; Joachim Krause, and Ludwig Pohl, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed Mar. 25, 1977, Ser. No. 781,276
Claims priority, application Germany, Mar. 29, 1976, 2613293
Int. Cl.[2] C09K 3/34; G02F 1/13; C07C 121/60, 121/64
U.S. Cl. 252—299 10 Claims

1. A biphenyl compound of the formula



wherein X is —CO—O or —O—CO, R_1 and R_4 are alkyl of 1–10 carbon atoms, and wherein R_2 is CN and R_3 is hydrogen when X is —O—CO and R_3 is CN and R_2 is hydrogen when X is —CO—O.

6. In a liquid crystalline dielectric composition having a negative dielectric anisotropy and comprising at least one liquid crystalline compound free of —CN, —NC and NO_2 radicals, the improvement wherein the composition contains 0.5–40% by weight of a compound of claim 1.

4,073,743

PROCESS FOR PREPARING AN EMULSION

Michael Midler, Jr., East Brunswick, and Edward Paul, Chatam Township, Union County, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 569,022, April 17, 1975, abandoned. This application Aug. 13, 1976, Ser. No. 714,428
Int. Cl.[2] B01J 13/00
U.S. Cl. 252—309 12 Claims

1. The method of preparing a water-in-oil emulsion, wherein the oil phase contains isomannide monooleate and a non-hydrated physiologically acceptable fatty acid metal salt, which comprises:

mixing the aqueous and oil phases at about 9° to about 35° C. at a relatively low agitator speed such that the value of the term N^3D^5/V remains below about 80×10^9 wherein N =

rpm, D = agitator diameter (inches), V = emulsion volume (liters); and

increasing the agitator speed such that the value of the term N^3D^5/V wherein N, D, and V are as defined above, is above about 140×10^9 to form a stable emulsion.

4,073,744

NITRITE BASED RUST INHIBITOR COMPLEX

Theo Ioannou Eliades, and Noemi Bernardo Ramirez, both of Scarborough, Canada, assignors to Surpass Chemicals Limited, Scarborough, Canada

Filed Jan. 3, 1977, Ser. No. 756,087
Int. Cl.² C23F 11/14
U.S. Cl. 252—389 R **18 Claims**

1. A rust inhibitor which is dispersible in petroleum based compositions consisting of a complex of a metal nitrite with a hetero-atomic aprotic polar organic solvent, which is miscible with at least 5% water and the hetero-atom being nitrogen, sulfur or oxygen; said complex being represented by the empirical formula:

$$M^{n+}(NO_2)_nL_Z$$

wherein

M is a metal ion of said metal nitrite

L is said hetero-atomic aprotic polar organic solvent

n is an integer of 1 or 2, and

z is equal to or greater than *n*.

8. A method for producing a nitrite based rust inhibitor which is dispersible in a petroleum based composition comprising reacting nitrous acid with a basically reacting metal salt in a medium consisting of a hetero-atomic aprotic polar organic solvent which is miscible with at least 5% water and the hetero-atom being nitrogen, sulfur or oxygen, and removing excess basically reacting metal salt after completion of the reaction to give a solution containing the desired nitrite based rust inhibitor.

4,073,745

MULTICHROMOPHORIC BENZOTRIAZOLE ULTRAVIOLET STABILIZERS AND THEIR USE IN ORGANIC COMPOSITIONS

Richard H. S. Wang, and Joseph S. Zannucci, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

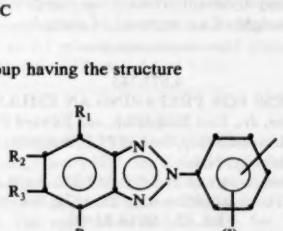
Division of Ser. No. 502,333, Sept. 3, 1974, Pat. No. 3,981,884. This application May 14, 1976, Ser. No. 687,080
Int. Cl.² C09K 15/32, 15/30; C08K 5/34
U.S. Cl. 252—403 **34 Claims**

1. An organic composition susceptible to ultraviolet light degradation stabilized against such degradation with a stabilizing amount of at least one multichromophoric compound having the formula:

A—B—C

wherein

A is a group having the structure

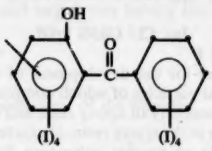


wherein

R_1, R_2, R_3 and R_4 are hydrogen, chloro, bromo, lower alkyl, substituted lower alkyl, cycloalkyl, substituted cycloalkyl, aryl, substituted aryl, lower alkylaryl, aryl-substituted-aryl, alkoxy, substituted amino, cyano, carboxy and the substituents R_1 and R_2, R_2 and R_3, and R_3 and R_4, combined with the carbon atoms to which they are attached, are joined alkylene groups completing a carbocyclic ring, which ring can also be substituted with one or more of the substituents listed above for R_1, R_2, R_3 and R_4;

I is the same as R_1, R_2, R_3 and R_4 and is present on all positions of the benzenoid ring, except the carbon atom attached to the heterocyclic ring and the carbon atom attached to the B group connecting the heterocyclic aromatic A group with the aromatic C group, wherein B is a group connecting A and C and can be alkylene, arylene, carbonyloxy, oxycarbonylalkyleneoxy, oxycarbonyl, alkyleneoxycarbonyloxy, oxyalkylenecarbonyloxy, oxycarbonyloxy, alkyleneoxy, oxyalkylene, alkyleneoxyalkyleneoxy, oxyalkylenearylenealkyleneoxy, thio, thioalkyleneoxy, sulfinyldioxy, oxy(alkoxy)phosphinooxy, aminocarbonyl, N-alkylaminocarbonyl, N-arylaminocarbonyl, aminocarbonylalkyleneoxy, N-alkylaminocarbonylalkyleneoxy, N-arylaminocarbonylalkyleneoxy, aminocarbonylamino, N-alkylaminocarbonylamino, N,N-dialkylaminocarbonyl, N-arylaminocarbonyl, N-alkylaminocarbonyl, N,N-diarylaminocarbonyl, amino, N-alkylamino, N-arylamino, N-alkylaminoalkyleneoxy, N-arylaminoalkyleneoxy, oxyalkyleneoxy, oxyaryleneoxy, alkyleneaminoalkylene, aryleneaminoarylene, aryleneaminoalkylene and alkyleneaminoarylene; and

wherein C is a hydroxybenzophenone group having the formula



where I is the same substituent as listed above and is present in all positions of the benzoid rings except the carbon atom attached to the B group connecting the A and C moieties, said B connecting group is attached to the benzoid ring in the ortho, meta or para position from the keto group of the benzophenone, and said I substituents can all be one of the substituents listed above or different listed substituents.

4,073,746

MIXTURES OF α,α′-BIS-(2-HYDROXY-3,5-DIALKYLPHENYL)-P-AND -M-DIISOPROPYLBENZENES, A PROCESS FOR THE PREPARATION THEREOF AND THE USE THEREOF AS STABILIZERS

Hans-Josef Buysch, Krefeld; Harald Oertel, Odenthal-Globusch, and Ernst Roos, Odenthal-Osenau, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed May 20, 1976, Ser. No. 688,146
Claims priority, application Germany, May 24, 1975, 2523106
Int. Cl.² C09K 15/08
U.S. Cl. 252—404 **8 Claims**

1. A mixture comprising at least 20 %, by weight, of an α,α′-bis-(2-hydroxy-3,5-dialkylphenyl)-m-diisopropylbenzene and an α,α′-bis-(2-hydroxy-3,5-dialkylphenyl)-p-diisopropylbenzene.

4,073,747

REGENERATION OF SPENT ACTIVATED CARBON WITH FORMALDEHYDE

Karel Popper, Danville; Wayne M. Camirand, El Cerrito; Gerald S. Williams, Richmond, and Edward P. Mecchi, Lafayette, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Dec. 13, 1976, Ser. No. 750,340
Int. Cl.[2] B01J *21/20*
U.S. Cl. 252—412 2 Claims

1. A process for regenerating spent carbon, which comprises contacting the spent carbon with an aqueous solution of formaldehyde in an amount sufficient to and for a period long enough to regenerate the carbon and

removing the aqueous solution of formaldehyde from the regenerated carbon.

2. The process of claim 1 wherein the regenerated carbon is rinsed with water to remove residual formaldehyde.

4,073,748

METHOD FOR PREPARING WETPROOFED CATALYST PARTICLES AND PARTICLES PRODUCED THEREBY

Glendon W. Brown; Mary Jane Fine, both of Chillicothe, and Larry O. Hill, Frankfort, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Jan. 21, 1977, Ser. No. 761,264
Int. Cl.[2] B01J *31/06*
U.S. Cl. 252—428 6 Claims

1. A method for preparing wetproofed carbon particles comprising:

a. mixing a measured amount of carbon particles having a size between 2 and 30 mesh with 0.6 - 20 percent by weight polytetrafluoroethylene resin,

said polytetrafluoroethylene resin being in an aqueous emulsion, and said aqueous emulsion being added to said carbon particles in amounts of less than approximately 100ml/100 grams, and

b. heating for a sufficient period of time to drive off the water from said aqueous emulsion and thereby setting said polytetrafluoroethylene resin as deposited non-uniformly on said carbon particles to yield a mixture of polytetrafluoroethylene coated carbon particles, some having a higher weight percent polytetrafluoroethylene resin thereon and others having a lower weight percent polytetrafluoroethylene resin thereon.

4,073,749

PROCESS FOR MANUFACTURING A CATALYST FOR THE SYNTHESIS OF AMMONIA AND PRODUCT THEREBY OBTAINED

Attilio Passariello, Tivoli (Rome), Italy, assignor to S.I.R.I. Societa' Italiana Ricerche Industriali S.p.A., Terni, Italy

Filed Dec. 18, 1975, Ser. No. 642,152
Int. Cl.[2] B01J *29/14, 23/76*
U.S. Cl. 252—455 R 2 Claims

1. A process for manufacturing a pellettized magnetite catalyst containing aluminum oxide, potash, calcium oxide as promoters and magnesium oxide, the percent by weight of said parameters being within 2.0 - 3.5 aluminum oxide, 0.8 - 2 potash, 2 - 3.5 calcium oxide and 0.1 - 0.4 magnesium oxide, consisting essentially of mixing the components, melting the mixture in a furnace at a temperature of at least 1600° C, cooling the melted mass in air, removing melted slag, crushing and powdering the remaining solid mass, adding water and bentonite, mixing the crushed and powdered mass, water and bentonite, granulating said mixture, dehydrating the granulate product at a temperature between 100° and 200° C, and sintering the granulates in an argon atmosphere at a temperature ranging between 1250° and 1350° C.

4,073,750

METHOD FOR PREPARING A HIGHLY DISPERSED SUPPORTED NICKEL CATALYST

David J. C. Yates, Westfield, and Lawrence L. Murrell, Elizabeth, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed May 20, 1976, Ser. No. 688,154
Int. Cl.[2] B01J *29/14, 23/74*
U.S. Cl. 252—459 12 Claims

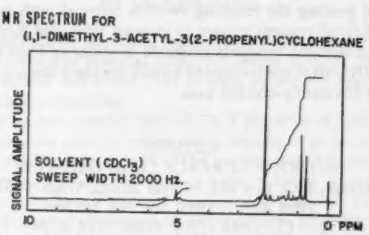
1. A highly dispersed nickel catalyst having a nickel surface area of from 200 to 400 m^2/gm nickel prepared by the method which comprises slurrying a nickel metal precursor dissolved in a nonaqueous organic liquid solvent with a high surface area refractory oxide support, removing the solvent to obtain a composite of said nickel metal precursor and said support, and activating said composite by reducing in hydrogen or hydrogen dilutes with an inert gas at conditions sufficient to convert substantially all of the nickel metal precursor to nickel metal.

4,073,751

1-ACETYL-3,3-DIMETHYL-(2-PROPENYL)CYCLOHEXANE PERFUME COMPOSITIONS

John B. Hall, Rumson; Mark A. Sprecker, Sea Bright; Frederick Louis Schmitt, Holmdel, and Manfred Hugo Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 713,429, Aug. 11, 1976, Pat. No. 4,021,488. This application Feb. 4, 1977, Ser. No. 765,866
Int. Cl.[2] C11B *9/00*
U.S. Cl. 252—522 2 Claims



1. A perfume composition comprising the compound 1-acetyl-3,3-dimethyl-(2-propenyl) cyclohexane and at least one adjuvant selected from the group consisting of natural perfume oils, synthetic perfume oils, alcohols, aldehydes, ketones, nitriles, esters and lactones.

4,073,752

HIGH NORMALITY ION EXCHANGE MEMBRANES CONTAINING ENTRAPPED ELECTROSTATICALLY BULKY MULTICHARGED IONS AND METHOD OF PRODUCTION

Floyd Lester Ramp, Richfield, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

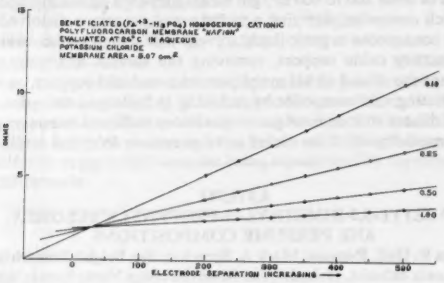
Filed June 2, 1975, Ser. No. 582,707
Int. Cl.[2] C08J *5/20;* C08F *8/42*
U.S. Cl. 260—2.1 R 6 Claims

1. An organic polyfluorocarbon ion exchange material containing an effective total ion concentration of at least 0.25N and comprising from about 0.01 to about 0.2N of ion sites originally present on and covalently-bonded to the material of said ion exchange material and the remaining ion sites being electrostatically bulky multi-charged ions of electric sign the same as said covalently-bonded ion sites and entrapped in the ion exchange pathways of the said ion exchange material.

2. An ion exchange material as defined in claim 1 and further characterized by membrane form, by said covalently-bonded ion sites being sulfonic acid groups, and the said entrapped ion sites being electro negative metal anion sites associated with

materials selected from the class consisting of phosphoric acid/iron reaction products, phosphoric acid/aluminum reaction products, the hydrous oxides of platinum, palladium, ruthenium and rhodium, and the highly electro negative oxide complexes of tantalum and niobium having the formula $[M_6O_{19}]^{-8}$ where M is a tantalum or niobium atom.

6. The method of increasing the total effective ion concentration of an organic polyfluorocarbon ion exchange material containing between about 0.01 and 0.2 N of covalently-bonded ion sites to a total effective ion concentration of at least 0.25N



comprising swelling said organic polyfluorocarbon material in the presence of an essentially electrically neutral Reagent A selected from the group consisting of vinylidene monomers containing at least a single $CH_2{=}C<$ group per molecule, aromatic ethers, aromatic amines, and salts of polyvalent metals and treating the resulting swollen material with an essentially neutral reagent known to interact with said Reagent A forming reaction products ionizable in water to form electrostatically-bulkyl multi-charged ions of the same electric charge as said covalently-bonded ions.

4,073,753

OUTDOOR SURFACE COMPOSITIONS

Stein Hauge, P.O. Box 462, Mercer Island, Wash. 98040

Filed Apr. 7, 1975, Ser. No. 566,034
Int. Cl.[2] C08J *11/04;* C08K *7/18, 3/34*
U.S. Cl. 260—2.3 **7 Claims**

1. A resilient, water pervious composition for playing surfaces and/or other utility areas, consisting of a mixture of particulate rubber and particulate inorganic solids, the particulate rubber being 10–50% by volume and having a particle size such that not more than 10% by volume passes a No. 100 sieve and substantially all passes a No. 8 sieve, the particulate inorganic solids being 90–50% by volume having a particle size such that 80–100% by volume passes a No. 8 sieve and not more than 15% by volume passes a No. 200 sieve.

4,073,754

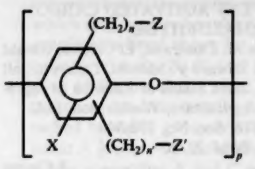
POLYMER ALLOYS OF PHOSPHONYLATED POLYSTYRENE OR POLYPHENYLENE OXIDE WITH CELLULOSE ESTER, POLYSTYRENE, OR UNSATURATED POLYESTER

Israel Cabasso, 627 Burgundy St., New Orleans, La. 70112; Joseph Jagur-Grodzinski, 22 Moskovitz St., and David Vofsi, Meonot Wolfson B, both of Rehovot, Israel

Continuation-in-part of Ser. No. 569,055, April 17, 1975, Pat. No. 4,008,191, which is a continuation of Ser. No. 358,061, May 7, 1973, abandoned. This application Aug. 14, 1975, Ser. No. 604,683
Claims priority, application Israel, May 12, 1972, 39426
Int. Cl.[2] B01D *13/04;* C08L *1/10*
U.S. Cl. 260—17 R **9 Claims**

1. A polymer alloy of

a. a phosphorus-containing polymer component having the formula:



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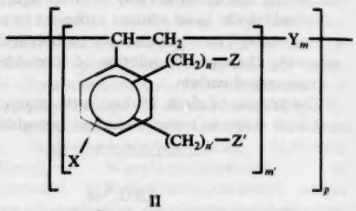


II

wherein X is hydrogen or halo; Z and Z' are each hydrogen or a phosphonate group $PO(OR)(OR_1)$ in which R and R_1 may be the same or different and are each alkyl or aryl, and in which Z and Z' are not both hydrogen; Y is a bivalent radical from an ethylenically unsaturated monomer copolymerized with styrene; *m* is zero or an integer less than 10; *m'* is an integer less than 10; *n* is any integer; *n'* is zero or any integer; and *p* is an integer greater than 10; and

b. a second polymer component compatible with and alloyed with the phosphorus-containing polymer component, said second component being a cellulose ester, or a polystyrene or unsaturated polyester resin.

9. A non-flammable or self-extinguishable fiber, film, fabric or shaped or foamed plastic article, constituted of the polymer alloy of claim 1.

4,073,755

PULVERULENT, TACKFREE, POURABLE, FILLER-CONTAINING ELASTOMER MIXTURES OPTIONALLY CONTAINING PLASTICIZER OIL, AS WELL AS PROCESSES FOR THEIR PRODUCTION AND UTILIZATION

Gerhard Berg, and Karl-Heinz Nordsiek, both of Marl, Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Germany

Filed Aug. 13, 1975, Ser. No. 604,133
Claims priority, application Germany, Aug. 16, 1974, 2439237
Int. Cl.[2] C08K *3/36;* C08L *1/28, 9/00*
U.S. Cl. 260—17.4 BB **22 Claims**

1. In a process for the production of pulverulent, tack-free, pourable, filler-containing elastomer particles by precipitating a stable, emulsified, homogeneous mixture of an aqueous elastomer emulsion and an aqueous dispersion of a solid filler for said elastomer in the presence of sufficient sodium silicate to form an aqueous suspension of the precipitated elastomer and the filler, the improvement which comprises:

a. precipitating the silicic acid in the aqueous suspension at a pH of 4.0 to 9.0 in the presence of 50–99% of the total amount of filler added to form said filler-containing elastomer particles, and then

b. mixing the thus-produced suspension of elastomer, filler and precipitated silicic acid with additional filler in the form of an emulsifier-free aqueous suspension.

4,073,756

SOLID ADHESIVE COMPOSITIONS

Yoshihiko Yotsuyanagi, Kobe; Naganori Araki, Sakai; Shigeru Nagasawa, Ageo, and Toshinao Okitsu, Tokyo, all of Japan, assignors to Konishi Co., Ltd., Osaka, Japan

Filed Apr. 26, 1976, Ser. No. 680,392
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—18 N 24 Claims

1. An adhesive composition comprising:

(a) an N-fatty acid acylated amino acid or a salt thereof in an amount of about 2 to 30% by weight of the total amount of the adhesive composition;

(b) a compound having in its molecule a polyoxyalkylene structure containing at least four oxyalkylene units in an amount of about 2 to 30% by weight of the total of the adhesive composition;

(c) a water soluble or water dispersible polymer having adhesive properties in an amount of about 5 to 50% by weight of the total amount of the adhesive composition; and

(d) water or a mixture of water and one or more organic solvent(s) and/or one or more plasticizer(s), wherein the total amount of component (d) is about 30 to about 80% by weight of the total adhesive composition, but wherein the proportion of the one or more organic solvent(s) and/or one or more plasticizer(s) is less than the amount of water used together therewith.

4,073,757

HARDENABLE, BORON-CONTAINING REINFORCING RESINS FOR RUBBER

Manfred Schmidt; Dieter Freitag, both of Krefeld; Hermann Fries, Schildgen, and Erich Esch, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 10, 1976, Ser. No. 749,456
Claims priority, application Germany, Dec. 20, 1975, 2557613
Int. Cl.[2] C08C *4/00;* C08G *8/32*
U.S. Cl. 260—19 R 10 Claims

1. A process for the production of hardenable boroncontaining reinforcing resins for rubber by reacting diphenylol alkane novolaks with boron compounds and unsaturated fatty acid or fatty acid esters, wherein 100 parts by weight of diphenylol alkane novolaks with an average molecular weight of from 400 to 1600 are reacted with from 20 to 100 parts by weight of a boric acid trialkyl ester containing from 1 to 4 carbon atoms in the alkyl chain or with from 18 to 90 parts by weight of boric acid or with from 10 to 50 parts by weight of boron trioxide in the presence of C_1–C_4-alcohols, and the boric acid ester resins obtained are reacted at elevated temperatures with from 15 to 35 parts by weight of an unsaturated fatty acid or esters thereof.

4,073,758

EMULSION COMPOSITIONS

Yasuharu Nakayama; Tadashi Watanabe; Yoshio Yamashita; Tetsuo Aihara, and Isao Toyomoto, all of Hiratsuka, Japan, assignors to Kansai Paint Company, Limited, Amagasaki, Japan

Filed Aug. 30, 1976, Ser. No. 718,767
Claims priority, application Japan, Sept. 12, 1975, 50-111225
Int. Cl.[2] C08L *63/10*
U.S. Cl. 260—23 EP 17 Claims

1. An emulsion composition prepared by the emulsion polymerization of a polymerizable vinyl monomer in the presence of an emulsifier in which the emulsifier is a neutralized addition polymerization polymer having as a side chain a maleinized, partially maleinized, fumarized or partially fumarized drying and/or semi-drying oil fatty acid residue linked to the main chain of the polymer by an ester bond, the emulsifier having an acid value of about 20 to about 350 prior to neutralization and being used in proportion to the vinyl monomer such that the total solid content of the resulting emulsion has an acid value of about 3 to about 150.

4,073,759

PROTECTING RUSTY METAL

James M. Lowry, and David Azar, both of Baton Rouge, La., assignors to Roadways International Corporation, Baton Rouge, La.

Continuation-in-part of Ser. No. 577,829, May 14, 1975, abandoned. This application June 3, 1976, Ser. No. 692,556
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—28.5 AS 16 Claims

1. A process for protecting corrodible metal against corrosion, which processs comprises applying to the metal a layer of an emulsion of asphalt and rubber in water, the emulsion containing at least about ½% of a polyamine surface active agent based on the weight of the dry asphalt, about 2 to about 5% dispersed rubber based on the weight of the dry asphalt and about 20% of a dispersed acrylate resin based on the weight of the dry asphalt, the surface active agent being an N-alkyl alkylene diamine in which the alkyl is 12 to 30 carbons long and the two amine groups have from one to three carbon atoms separating them.

4,073,760

METHOD OF PACKAGING ASPHALT MATERIAL AND IMPROVED PRODUCT RESULTING THEREFROM

Robert J. Harris, Marrero, and Gail T. Sikes, Harvey, both of La., assignors to H. C. Price Co., Bartlesville, Okla.

Filed July 23, 1976, Ser. No. 708,196
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—28.5 AS 4 Claims

1. A method of providing asphalt base coating material for pipe wherein said material comprises about 10% to 25% by weight asphalt and about 75% to 90% by weight aggregate, said method comprising:

supplying said coating material in a plurality of individual containers, each of which has a weight of no more than about 5% of the weight of the coating material contained thereby, and each of said containers being constructed primarily from a material containing at least one member of the group consisting of polyethylene, polypropylene, and polyethylene-polypropylene copolymer;

chopping said containers and said coating material to reduce the size thereof and present a mixture of said container and said coating material particles;

raising the temperature of said mixture to melt said particles and present a flowable liquid; and

stirring said liquid to distribute the melted container particles throughout the melted coating material particles and present a coating composition.

4,073,761

POLYETHYLENE EMULSION CONTAINING RESIN BINDER COMPOSITIONS AND PROCESSES

Richard C. Bowman, Sanborn, and Daniel J. Kay, Williamsville, both of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 174,217, Aug. 23, 1971, abandoned, which is a continuation of Ser. No. 880,408, Nov. 26, 1969, abandoned, which is a continuation-in-part of Ser. No. 818,076, April 21, 1969, abandoned. This application Apr. 11, 1975, Ser. No. 567,332
Int. Cl.[2] C08L *61/10*
U.S. Cl. 260—29.3 10 Claims

4. In a binder composition comprising (a) a resinous binder and (b) an accelerator, wherein the resinous binder comprises a one-step phenol-formaldehyde resin and a urea resin component selected from the group consisting of a urea-formaldehyde resin and a thiourea-formaldehyde resin, wherein the improvement comprises the accelerator consisting essentially of a mixture of (1) an aqueous emulsion of polyethylene, (2) an

aqueous solution of a compound selected from the group consisting of a strong mineral acid, an organic acid, an ammonium salt of a strong mineral acid and an ammonium salt of an organic acid, and (3) a compound selected from the group consisting of urea, thiourea, and mixtures thereof.

4,073,762

AQUEOUS EPOXY RESIN PAINT COMPOSITION

Minoru Hosoda, No. 2473-89, Shimonagaya, Kohnan, Yokohama, Kanagawa; Eiichi Kasiwagi, 7-7-407 Zengyo-danchi, No. 3768-3, Fujisawa, Fujisawa, Kanagawa; Fumio Murayama, No. 95-3, Wada, Hodogaya, Yokohama, Kanagawa, and Kohei Isayama, No. 20-41, 2-chome, Dai, Kamakura, Kanagawa, all of Japan

Division of Ser. No. 509,315, Sept. 25, 1974, Pat. No. 3,983,056. This application Mar. 12, 1976, Ser. No. 666,453

Claims priority, application Japan, Sept. 27, 1973, 48-108808; Sept. 27, 1973, 48-108809; Oct. 1, 1973, 48-110393; Dec. 24, 1973, 48-3633

The portion of the term of this patent subsequent to Sept. 28, 1993, has been disclaimed.

Int. Cl.[2] **C08L** *61/06*

U.S. Cl. 260—29.3 **7 Claims**

1. An aqueous epoxy resin paint composition comprising an epoxy resin emulsion formed by emulsifying in water (A) 98 to 50% by weight of a bisphenol type epoxy resin and (B) 2 to 50% by weight novolak type epoxy resins, with a non-ionic surface active agent, and a curing agent incorporated in said epoxy resin emulsion.

4,073,763

STABILIZATION OF CATIONICALLY MODIFIED ACRYLAMIDE POLYMERS

Wun Ten Tai, Palos Hills, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 489,966, July 19, 1974, abandoned. This application Nov. 3, 1975, Ser. No. 628,016

Int. Cl.[2] **C08L** *33/26*

U.S. Cl. 260—29.4 UA **3 Claims**

1. A method for improving the stability of a water-in-oil emulsion of a finely divided cationically modified acrylamide polymer, said polymer being made essentially by the steps of:

A. Preparing an aqueous solution of formaldehyde and a secondary amine containing 2 to 8 carbon atoms with the molar ratio of formaldehyde to secondary amine containing 2 to 8 carbon atoms being from 10:1 to 1:10 to provide a formaldehyde adduct; and,

B. Adding the formaldehyde adduct prepared in Step A to a water-in-oil emulsion of a finely divided acrylamide polymer in an amount sufficient to provide a molar ratio of formaldehyde adduct to acrylamide polymer of from 10:0.1 to 0.1:10, said water-in-oil emulsion of finely divided acrylamide polymer containing from:

a. 10–50% by weight polymer;

b. 30–95% by weight of an aqueous phase consisting of the polymer and the water present;

c. 5–70% by weight of a hydrophobic hydrocarbon liquid; and,

d. 1.0 to 21.0% by weight of a water-in-oil emulsifying agent; followed by,

C. Mixing the formaldehyde adduct and said water-in-oil emulsion of a finely divided acrylamide polymer for a period of time sufficient to produce a stable water-in-oil emulsion of a finely divided cationically modified acrylamide polymer;

said improvement comprising adding to said water-in-oil emulsion of a finely divided cationically modified acrylamide polymer at a temperature of from about 0° to about 40° C. a stabilizer selected from the group consisting of SO_2, $NaHSO_3$, $KHSO_3$, $Na_2S_2O_5$, and $K_2S_2O_5$ to adjust the pH of said water-in-oil emulsion to between 1 and 7, over a time sufficient to produce a water-in-oil emulsion of a cationically modified acrylamide polymer having increased stability.

4,073,764

DEGRADABLE PLASTIC COMPOSITION

Heinz-Peter Hemmerich; Gerhard Winter; Hans Jurgen Rosenkranz, and Peter Woditsch, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 18, 1975, Ser. No. 597,269

Claims priority, application Germany, July 27, 1974, 2436260

Int. Cl.[2] **C08J** *3/20*

U.S. Cl. 260—37 N **8 Claims**

1. A plastic composition degradable under the influence of weather or light, cimprising a plastic material and about 0.1 to 60% by weight of the composition of finely divided titanium dioxide with a specific surface of more than about 20 m^2/g, the titanium dioxide having been obtained by hydrolyzing a titanium compound in aqueous solution.

4,073,765

FILLED POLYPHENYLENE ETHER COMPOSITIONS HAVING IMPROVED TOUGHNESS

Arthur Katchman, Delmar, and Gim Fun Lee, Jr., Albany, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 21, 1976, Ser. No. 753,510

Int. Cl.[2] **C08G** *65/44;* **C08K** *3/24*

U.S. Cl. 260—40 R **8 Claims**

1. A filled thermoplastic molding composition which, after molding, has enhanced impact strength and enhanced tensile elongation, said composition comprising in admixture:

(a) a polyphenylene ether resin;

(b) a styrene resin;

(c) a titanate filler; and

(d) an adipic acid based polyester in an amount at least sufficient to provide enhanced impact strength and enhanced tensile elongation in the molded article.

4,073,766

ORGANIC BORATE COUPLING AGENTS

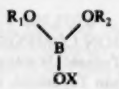
Marvin Michael Fein, Westfield; Birendra Kumar Patnaik, Parsippany, and Frank K. Y. Chu, Ramsey, all of N.J., assignors to Dart Industries, Inc., Los Angeles, Calif.

Filed Dec. 15, 1976, Ser. No. 750,753

Int. Cl.[2] **C08K** *9/04*

U.S. Cl. 260—42.14 **18 Claims**

1. A method of improving the properties of a filler for polymers, which comprises coating the filler with from about 0.5 to about 5 percent based on the weight of the filler of a coupling agent having the general formula



wherein R_1 is an alkyl group having from about 1 – 6 carbon atoms, and R_2 and X each is a long chained hydrocarbon group containing from 8 to 22 carbon atoms.

4,073,767

HYDROGEN PHOSPHONATES AND POLYMERS CONTAINING THEM AS FLAME RETARDANTS

Gail H. Birum, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

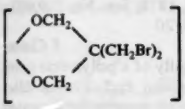
Filed Sept. 3, 1976, Ser. No. 720,487

Int. Cl.[2] **C07F** *9/08;* **C08K** *5/53*

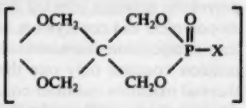
U.S. Cl. 260—45.8 R **17 Claims**

1. A cyclic phosphorus compound having the formula

where Y is selected from the group consisting of



and



and where X is selected from the group consisting of

where R is an alkyl radical of 1 to 4 carbon atoms, and R_b is a phenyl radical of 6 to 10 carbon atoms,

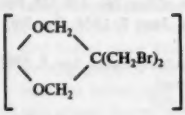
where R_c is phenyl with 0 to 2 halogens, or phenyl with 0 to 2 nitro groups, or phenyl with 0 to 2 methyl groups,

where R_d is phenyl with 0 to 2 halogen atoms, or phenyl with 0 to 2 methyl groups, or an alkyl or alkenyl radical of 1 to 3 carbon atoms, and

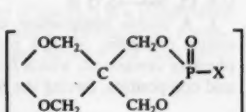
where R_e is phenyl with 0 to 2 halogens, or alkyl or alkenyl of 1 to 3 carbon atoms.

11. The combination of an organic polymer together with a phosphonate adduct having the formula

where Y is selected from the group consisting of



and



and where X is selected from the group consisting of

where R is an alkyl radical of 1 to 4 carbon atoms, and R_b is a phenyl radical of 6 to 10 carbon atoms,

where R_c is phenyl with 0 to 2 halogens, or phenyl with 0 to 2 nitro groups, or phenyl with 0 to 2 methyl groups,

-continued

where R_d is phenyl with 0 to 2 halogen atoms, or phenyl with 0 to 2 methyl groups, or an alkyl or alkenyl radical of 1 to 3 carbon atoms, and

where R_e is phenyl with 0 to 2 halogens, or alkyl or alkenyl of 1 to 3 carbon atoms.

4,073,768

NON-OPAQUE FLAME RETARDANT POLYCARBONATE COMPOSITION

Victor Mark, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 429,126, Dec. 28, 1973, Pat. No. 3,978,024. This application Oct. 29, 1975, Ser. No. 626,935

Int. Cl.² C08K 5/42

U.S. Cl. 260—45.7 S **18 Claims**

1. A non-opaque flame retardant carbonate polymer composition selected from the group consisting of:

a. an aromatic carbonate polymer having in admixture from 0.001 to about 2.0 parts per hundred parts of the carbonate polymer of an additive selected from the group consisting of the metal salts of unsubstituted and substituted monomeric phenol ester sulfonic acid and the metal salt of unsubstituted and substituted polymeric phenol ester sulfonic acid, and mixtures thereof, wherein the metal salts are selected from the group consisting of the alkali metal salts and alkaline earth metal salts and mixtures of these metal salts, and the substituent on the metal salts of the substituted monomeric and polymeric phenol ester sulfonic acid is selected from the group consisting of an electron withdrawing radical, and mixtures of electron withdrawing radicals;

b. an aromatic carbonate polymer containing from 0.001 to about 2.0 parts per hundred parts of the carbonate polymer of a metal salt of a sulfonic acid substituted carbonate polymer; and

c. mixtures of (a) and (b); said carbonate polymer and additive having a refractive index in the range of 1.54 to 1.65.

4,073,769

ESTERS OF PHOSPHOROUS ACID

Erich Eimers; Dieter Margotte, both of Krefeld; Helmut Schmid, and Rolf Dhein, both of Krefeld-Bockum, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 409,503, Oct. 25, 1973, abandoned, which is a continuation-in-part of Ser. No. 278,909, Oct. 9, 1972, Pat. No. 3,794,629. This application Nov. 25, 1975, Ser. No. 635,010

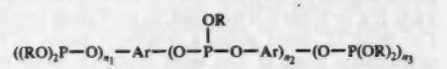
Claims priority, application Germany, Aug. 11, 1973, 2140207

The portion of the term of this patent subsequent to Feb. 26, 1991, has been disclaimed.

Int. Cl.² C08K 5/52

U.S. Cl. 260—45.8 R **6 Claims**

1. A plastics material comprising an aromatic polycarbonate and 0.01 to 0.2 weight %, based on the weight of the aromatic polycarbonate and the phosphite, of a phosphite of the formula



wherein

n_1 is an integer;

n_2 is 0 or an integer;

n_3 is an integer;

at least one of the groups R is an oxetane group or a hydrocarbon radical being substituted by at least one oxetane group; the remaining groups R are identical or different and are selected from alkyl, aralkyl, cycloalkyl, aryl and hetaryl groups; and Ar are the same or different at-least-divalent aromatic groups, the free valences of which are directly linked to the aromatic nuclei.

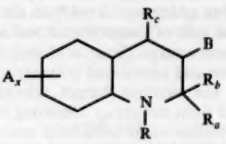
4,073,770

SUBSTITUTED DECAHYDROQUINOLINES AND THEIR USE AS ULTRAVIOLET LIGHT STABILIZERS

Pyong-Nae Son, Akron, and Robert Wesley Layer, Cuyahoga Falls, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed June 18, 1976, Ser. No. 697,345
Int. Cl.² C08J 3/20
U.S. Cl. 260—45.8 NW **11 Claims**

1. Compositions comprising (A) materials subject to ultraviolet light degradation and (B) from about 0.05 part to about 10 parts by weight per 100 parts by weight of the material of substituted decahydroquinoline compounds and the dimers thereof having the structural formula



wherein R is selected from the group consisting of alkyl groups containing 1 to about 24 carbon atoms, aralkyl groups of 7 to about 14 carbon atoms, cyclohexylalkyl groups of 7 to about 14 carbon atoms total, hydroxyalkyl groups containing 1 to about 12 carbon atoms, haloalkyl groups containing 1 to about 12 carbon atoms, cyanoalkyl groups containing 2 to about 12 carbon atoms, aminoalkyl or iminoalkyl groups containing 2 to about 12 carbon atoms, ether groups containing 3 to about 18 carbon atoms total in the group, hydroxyalkylether or cyanoalkylether groups containing 4 to about 18 carbon atoms total in the group, and the group

R_a, R_b, and R_c each independently are alkyl groups containing 1 to about 12 carbon atoms, cyclohexyl groups, or cyclohexylalkyl groups containing 7 to about 14 carbon atoms; A is selected from the group consisting of alkyl groups containing 1 to about 24 carbon atoms, hydroxyalkyl groups containing 1 to about 12 carbon atoms, alkoxy groups containing 1 to about 12 carbon atoms in the group, ester groups containing a total of from 2 to about 24 carbon atoms in the group, a cyclohexyl group, cyclohexylalkyl groups containing 7 to about 14 carbon atoms in the group, a hydroxy group, amino groups and aminoalkyl groups and alkyl-substituted amino and aminoalkyl groups wherein the alkyl contains 1 to about 12 carbon atoms; x is 0, 1, 2, or 3; and B is hydrogen, an alkyl group containing 1 to about 12 carbon atoms, a cyclohexyl group, or a cyclohexylalkyl group of 7 to about 14 carbon atoms in the group; and, further, wherein the dimers of the above compounds are essentially two decahydroquinoline compounds of the above structural formula attached to each other at the 4-positions, the 6-positions, the 8-positions, the 4'-,6'-positions, and the 4'-,8-positions on the molecule.

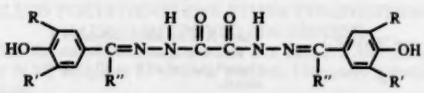
4,073,771

STABILIZED POLYMERIC COMPOSITION AND PRODUCT USING SAME

Ray Lawson Hartless, Lopatcong Township, Warren County, N.J., and Anthony Marion Trozzolo, South Bend, Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 500,957, Aug. 27, 1974, abandoned. This application July 29, 1976, Ser. No. 709,603
Int. Cl.² C08K 5/20
U.S. Cl. 260—45.9 NC **5 Claims**

1. A composition consisting essentially of a polymeric composition, the said polymeric composition exclusive of filler being at least 90 percent by weight of essentially saturated polyolefin polymer selected from the group consisting of homopolymers and copolymers, said polymer containing a stabilizer composition characterized in that the said stabilizer composition contains only one thermal oxidation stabilizer, said thermal oxidation stabilizer consisting essentially of at least one compound chosen from the group consisting of compounds in accordance with the formula



in which R is an alkyl substituent containing a tertiary carbon, said tertiary carbon being attached directly to the phenyl ring, in which R' is hydrogen or an alkyl substituent which may also contain a tertiary carbon, and in which R'' is hydrogen or an alkyl substituent, and in which any of the phenyl hydrogens bonded directly to either of the phenyl rings may be replaced by a hydrocarbon substituent, wherein said saturated polyolefin polymer contains a percentage by weight of said thermal oxidation stabilizer in the range of .01 to 0.5.

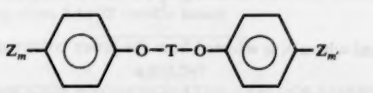
4,073,772

PLASTIC COMPOSITIONS

Arnold L. Anderson, Antioch, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 499,727, Aug. 22, 1974, Pat. No. 4,016,138, which is a continuation of Ser. No. 330,823, Feb. 8, 1973, abandoned. This application June 7, 1976, Ser. No. 693,321
The portion of the term of this patent subsequent to Apr. 5, 1994, has been disclaimed.
Int. Cl.² C08K 5/05
U.S. Cl. 260—45.75 B **26 Claims**

1. A plastic composition comprising a three component system consisting of (1) a poly(phenylene oxide), (2) a bisphenoxy compound, which functions as a flame retardant for said composition, having the formula

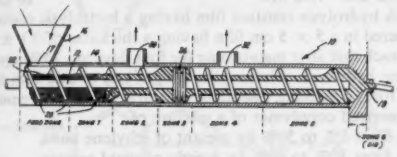


wherein (a) Z is bromine; (b) m and m' are independent and are integers having a value of from 1 to 5 with the proviso that the bromine atom content is from 6 to 10 bromine atoms; and (c) T is a straight or branched chain carbon group having from one to four carbon atoms, and (3) a flame retardant enhancing agent.

4,073,773
MELT POLYMERIZATION METHOD FOR MAKING POLYETHERIMIDES

Eugene G. Banucci, Scotia, and Gary A. Mellinger, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

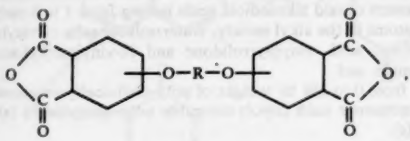
Filed Dec. 30, 1976, Ser. No. 755,686
Int. Cl.[2] C08G 73/10
U.S. Cl. 260—47 CP 16 Claims



1. In an extrusion melt polymerization method for making polyetherimides wherein a reaction mixture containing as essential ingredients (I) an organic diamine of the formula,

$$H_2NR^1NH_2$$

and (II) an aromatic bis(ether anhydride) of the formula,



and (I) is present in an amount of 0.5 to 2.0 moles per mole of (II), is continuously fed through an inlet opening into a screw extruder having a barrel maintained at melt polymerization temperatures and water of reaction is continuously vented from the extruder, where R is a divalent aromatic organic radical having from 6 to 30 carbon atoms, R^1 is a divalent organic radical selected from the group consisting of said R radicals, alkylene radicals having from 2 to about 20 carbon atoms, cycloalkylene radicals, and $C_{(2-8)}$ alkylene terminated polydiorganosiloxane radicals, the improvement comprising:

(A) using a screw extruder having a second opening through the extruder wall and having an outlet orifice, said second opening being in a second barrel zone intermediate said inlet opening and said orifice, said second barrel zone being maintained at melt polymerization temperature;

(B) continuously conveying the reaction mixture through a first barrel zone maintained at a temperature below the melting point of the lowest melting essential ingredient, said first barrel zone extending from said inlet opening to said second barrel zone; and

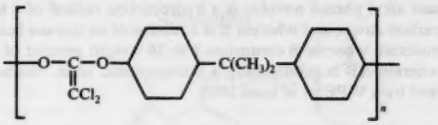
(C) continuously venting water of reaction at a temperature of up to 400° C through said second opening while continuously feeding reaction mixture through said inlet opening.

4,073,774
PREPARATION OF DICHLOROETHYLENE POLYMERS

Clayton B. Quinn, Mount Vernon, Ind., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 20, 1977, Ser. No. 789,028
Int. Cl.[2] C08G 63/62
U.S. Cl. 260—47 UA 7 Claims

1. The process for making solid polymers comprising units of the formula



where n is a whole number greater than 1, which comprises effecting reaction between a dialkali-metal salt of bisphenol-A and tetrachloroethylene in an aprotic solvent and thereafter isolating the formed polymers, there being employed a molar ratio of from 0.9 to 1.1 mols of the dialkali-metal salt of bisphenol-A per mol of the tetrachloroethylene.

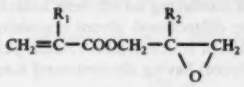
4,073,775
POWDER COATING COMPOSITION

Shunji Matsuo; Kiichiro Sasaguri; Katsuyuki Nakamura, all of Fuji; Yoshio Matsumoto, Nobeoka, and Mikio Sato, Fuji, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed June 8, 1976, Ser. No. 693,913
Claims priority, application Japan, June 12, 1975, 50-70178
Int. Cl.[2] C08G 51/84, 45/04, 45/00; C08F 24/00
U.S. Cl. 260—47 EP 10 Claims

1. A powder coating composition comprising (A) 100 parts by weight of an epoxy group-containing copolymer of

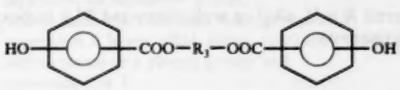
1. from 3 to 35% by weight, based on said copolymer, of a monomer represented by the following general formula



wherein R_1 and R_2 stand for a hydrogen atom or a methyl group, and

2. from 97 to 65% by weight of an ethylenically unsaturated monomer selected from the group consisting of acrylic acid esters, methacrylic acid esters, acrylonitrile, methacrylonitrile, styrene, vinyltoluene and α-methylstyrene, said copolymer having a glass transition point of 30° to 90° C,

and (B) 3 to 40 parts by weight of at least one of compounds represented by the general formula



wherein R_3 stands for a hydrocarbon radical having 2 to 20 carbon atoms or a linking group containing, at least at its both terminals, hydrocarbon radicals and in its main chain at least one member selected from the group consisting of an ether linkage, ester linkage, urethane linkage and amide linkage, and having totally 4 to 20 carbon atoms.

4,073,776
TACKIFIERS FOR ELASTOMERS

Thomas M. Galkiewicz, Schenectady; Kenneth C. Petersen, Scotia, and John L. Sullivan, Ballston Lake, all of N.Y., assignors to Schenectady Chemicals, Inc., Schenectady, N.Y.

Filed Jan. 28, 1975, Ser. No. 544,772
Int. Cl.[2] C08G 8/20, 16/04
U.S. Cl. 260—51 EP 23 Claims

1. A tackifier suitable for use with sulfur curable hydrocarbon, halohydrocarbon or hydrocarbon-acrylonitrile elastomers, comprising a resin reaction product AB, wherein A is the residue of an alkyl phenol novolac resin, wherein the alkyl of

said alkyl phenol novolac is a hydrocarbon radical of 4 to 16 carbon atoms; and wherein B is a residue of an oxirane bearing material, wherein B comprises 1 to 38 weight percent of AB; wherein AB is substantially a thermoplastic resin, characterized by a WPE of at least 2000.

4,073,777

RADIATION CROSSLINKABLE POLYESTER AND POLYESTERAMIDE COMPOSITIONS CONTAINING SULFONATE GROUPS IN THE FORM OF A METALLIC SALT AND UNSATURATED GROUPS

George J. O'Neill, and James G. Pacifici, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 17, 1975, Ser. No. 541,965
Int. Cl.[2] C08G *63/20*
U.S. Cl. 260—75 S 15 Claims

1. A linear, radiation crosslinkable, water-dissipatable polymer having carbonyloxy interconnecting groups in the linear molecular structure and having an inherent viscosity of at least about 0.1 measured in a 60/40 parts by weight solution of phenol/tetrachloroethane at 25° C. and at a concentration of about 0.25 gram of polymer in 100 ml. of said solvent, said polymer being prepared from components comprising:

a. at least one unsubstituted saturated aliphatic, unsubstituted saturated cycloaliphatic or unsubstituted aromatic dicarboxylic acid combining no ethylene unsaturation;

b. at least one difunctional glycol containing two —CH$_2$—OH groups of which at least 15 mole percent is a poly(ethylene glycol) having the structural formula:

$$H(OCH_2\text{-}CH_2)_nOH$$

n being an integer in the range between about 2 and about 20;

c. an amount sufficient to provide said water-dissipatable characteristic of said polymer of at least one difunctional sulfomonomer containing at least one metal sulfonate group attached to an aromatic nucleus wherein the functional groups are hydroxy, carboxyl or amino;

d. an α,β-unsaturated acid having the formula:

$$R—CH{=}CH—R^1$$

wherein R is H, alkyl or arylcarboxy and R^1 is carboxy or arylcarboxy.

4,073,778

CROWN ETHER ACTIVATED LACTAM POLYMERIZATION

James P. Collman, Stanford, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed June 7, 1976, Ser. No. 693,578
Int. Cl.[2] C08G *69/20*
U.S. Cl. 260—78 L 22 Claims

1. A process for the anionic polymerization of a lactam to a polylactam, capable of being made into filaments, films or shaped articles, which comprises polymerizing a mixture of lactam, anionic catalyst and a catalytically effective amount of a crown macrocyclic polyether having the ability to form complexes with said anionic catalyst and having 12–30 atoms in its polyether ring including 4–10 oxygen atoms and wherein said oxygen atoms are separated from each other by two or three carbon atoms.

4,073,779

HYDROLYSIS-RESISTANT, FILM-FORMING COPOLYMER DISPERSIONS

Hubert Wiest; Rainer Berger, and Erwin Lieb, all of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Aug. 11, 1976, Ser. No. 713,420
Claims priority, application Germany, Sept. 19, 1975, 2541934
Int. Cl.[2] C08F *210/02;* C08L *23/08*
U.S. Cl. 260—79.3 MU 10 Claims

1. A hydrolysis-resistant film having a hydrolysis resistance measured in a 5 × 5 cm film having a thickness of 0.1 ± 0.02 mm, such that after maintaining for four days in a 25% aqueous sodium hydroxide solution, the weight loss of said film is less than 10%, consisting essentially of a dried film of an emulsion polymerized copolymer of a mixture of

(a) from 5% to 50% by weight of ethylene units,

(b) from 10% to 60% by weight of vinyl acetate,

(c) from 20% to 70% by weight of vinyl chloride units,

(d) from 5% to 30% by weight of alkyl methacrylate units having from 1 to 8 carbon atoms in the alkyl moiety,

(e) from 0 to 5% by weight of olefinically unsaturated monomer units copolymerizable with components (a) to (e) selected from the group consisting of alkenoic acids having from 3 to 8 carbon atoms, amides of said alkenoic acids, N-methylol amides of said alkenoic acids, alkenedioic acids having from 4 to 8 carbon atoms, monoalkyl esters of said alkenedioic acids having from 1 to 8 carbon atoms in the alkyl moiety, water-soluble salts of vinylsulfonic acid, vinylpyrrolidone and N-vinylmethyl-acetamide, and

(f) from 0 to 2% by weight of poly-olefinically-unsaturated monomer units copolymerizable with components (a) to (e).

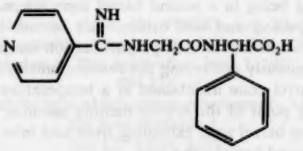
4,073,780

4-PYRIDYLFORMIMIDOYLGLYCYL-D-PHENYLGLYCINE

Thomas M. Brennan, Old Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 692,323, June 3, 1976, abandoned. This application Feb. 24, 1977, Ser. No. 771,773
Int. Cl.[2] C07C *103/52*
U.S. Cl. 260—112.5 R 1 Claim

1. The compound, 4-pyridylformimidoylglycyl-D-phenylglycine, of the formula:



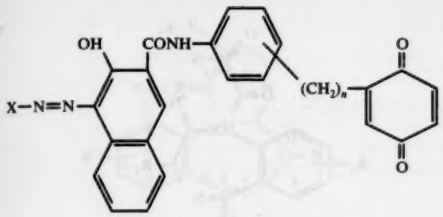
4,073,781

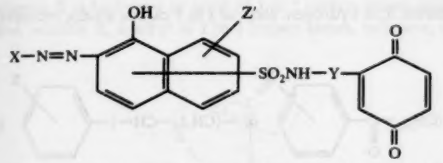
METHOD OF PRODUCTION OF AZO DYES FROM A QUINONE CONTAINING COMPOUND AND A DIAZONIUM COMPOUND

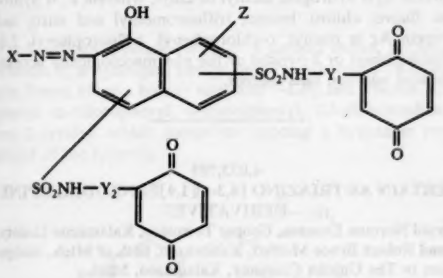
Yukio Maekawa, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

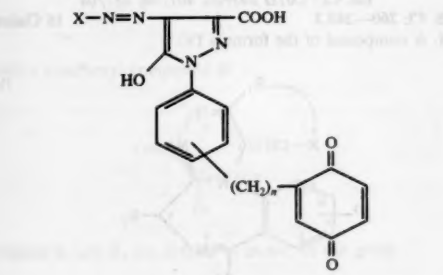
Filed June 19, 1975, Ser. No. 588,438
Claims priority, application Japan, June 20, 1974, 49-70668
Int. Cl.[2] C07C *107/02, 107/04, 107/08*
U.S. Cl. 260—152 7 Claims

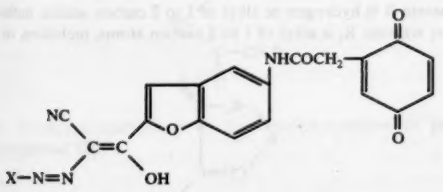
1. A method for preparation an azo dye containing a quinone residue comprising reacting a p-quinone residue-containing coupler with a diazonium compound, the reaction taking place preferentially at a position other than at the p-quinone nucleus, to produce an azo dye containing a quinone residue selected from the following general formulae:

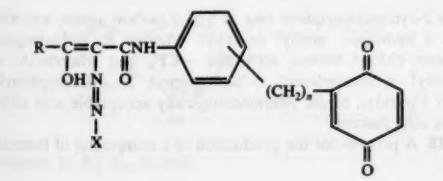




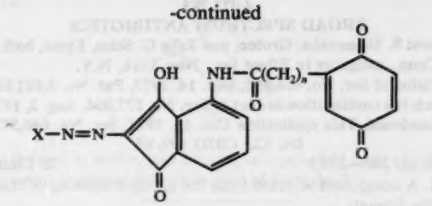


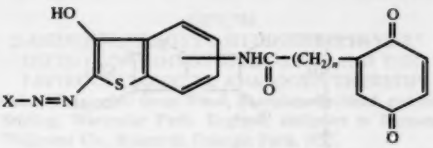


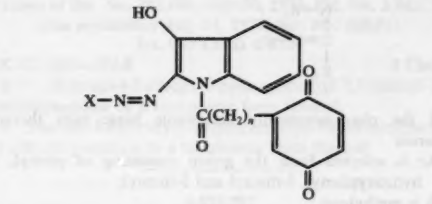




-continued



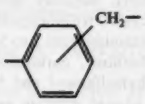




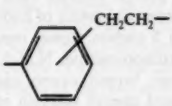
wherein

X represents an aryl group or an aromatic heterocyclic group;

Y represents a methylene group, an ethylene group,



or



;

Z' represents hydrogen or an acylamino group;

Z represents an acylamino group;

Y_1 and Y_2 each represents the same groups as Y;

R represents a lower alkyl group containing from 1 to 6 carbon atoms or a phenyl group; and

n represents 1 or 2.

4,073,782

WRAPPING FILM

Hidehiro Kishi; Hiroshi Harakawa, both of Ichihara; Kazuo Ogawa, Chiba, and Seiko Tsutsui, Ichihara, all of Japan, assignors to UBE Industries, Ltd., Ube, Japan

Filed Jan. 27, 1976, Ser. No. 652,765

Claims priority, application Japan, Jan. 31, 1975, 50-12348

Int. Cl.[2] C08L *91/00*

U.S. Cl. 260—23 H **8 Claims**

1. A wrapping film comprising a composition which comprises (I) 100 parts by weight of a film forming polymeric material selected from the group consisting of (A) polyethylene, (B) copolymers of 25% by weight or less of vinyl acetate and 75% by weight or more of ethylene, and (C) mixtures of (A) and (B), (II) 0.5 to 6 parts by weight of sorbitan monoleate and (III) 0.5 to 6 parts by weight of a liquid paraffin having a dynamic viscosity of 30 to 80 centi-stokes determined at a temperature of 38° C.

4,073,783

BROAD SPECTRUM ANTIBIOTICS

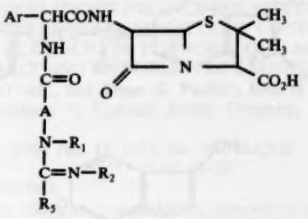
Ernest S. Hamanaka, Groton, and John G. Stam, Lyme, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 424,891, Dec. 14, 1973, Pat. No. 3,951,952, which is a continuation-in-part of Ser. No. 277,064, Aug. 2, 1972, abandoned. This application Dec. 15, 1975, Ser. No. 640,573

Int. Cl.[2] C07D *499/68*

U.S. Cl. 260—239.1 29 Claims

1. A compound selected from the group consisting of those of the formula



and the pharmaceutically acceptable basic salts thereof, wherein

Ar is selected from the group consisting of phenyl, 4-hydroxyphenyl, 2-thienyl and 3-thienyl;

A is methylene;

R_1 and R_2 are each selected from the group consisting of hydrogen and alkyl containing from 1 to 3 carbon atoms;

R_5 is selected from the group consisting of naphthyl; phenyl, benzyl; monosubstituted phenyl wherein said substituent is selected from the group consisting of fluoro, chloro, iodo, bromo, methyl, methoxy, acetyl, dimethylamino, amidino, phenyl, cyano, trifluoromethyl, amino, hydroxy, alkanoylamino containing from 2 to 5 carbon atoms, methylthio, nitro, carbethoxy, carboxamido, methylsulfony, sulfamoyl, N-methylsulfamoyl and N,N-dimethylsulfamoyl; disubstituted phenyl wherein each substituent is selected from the group consisting of hydroxy, alkoxy containing from 1 to 5 carbon atoms, methylthio, acetoxy, methylsulfonyl, trifluoromethyl, N,N-dimethylsulfamoyl, iodo, chloro, fluoro, bromo, cyano, carbethoxy, and allyloxy; trisubstituted phenyl wherein each substituent is selected from the group consisting of fluoro, chloro, bromo, iodo and methoxy; and substituted benzyl wherein said substituent is selected from the group consisting of chloro, fluoro, methoxy, hydroxy, dichloro, methyl and trifluoromethyl.

4,073,784

CERTAIN AS-TRIAZINO[4,3-A][1,4]BENZODIAZEPINE-1,2-DIONE COMPOUNDS

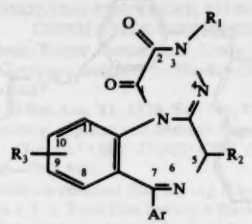
Robert Bruce Moffett, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 9, 1977, Ser. No. 775,728

Int. Cl.[2] C07D *487/04*

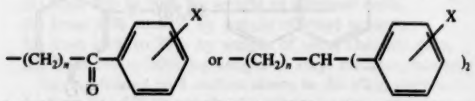
U.S. Cl. 260—243.3 10 Claims

1. A compound of the formula V:



V

wherein R_1 is hydrogen, alkyl of 1 to 3 carbon atoms, inclusive,



in which *n* is 2 or 3, and X is hydrogen, fluoro or chloro; wherein R_2 is hydrogen, methyl or ethyl; wherein R_3 is hydrogen, fluoro, chloro, bromo, trifluoromethyl and nitro; and wherein Ar is phenyl, o-chlorophenyl, o-fluorophenyl, 2,6-difluorophenyl or 2-pyridyl or the pharmacologically acceptable acid addition salts thereof.

4,073,785

CERTAIN AS-TRIAZINO [4,3-a][1,4]BENZODIAZEPINE DERIVATIVES

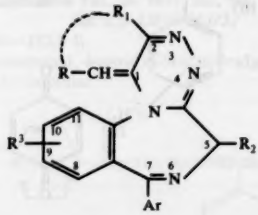
Gerald Norman Evenson, Cooper Township, Kalamazoo County, and Robert Bruce Moffett, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 9, 1977, Ser. No. 775,725

Int. Cl.[2] C07D *243/20, 401/04, 487/04*

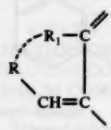
U.S. Cl. 260—243.3 16 Claims

1. A compound of the formula IV:



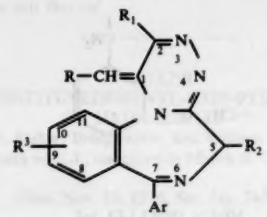
IV

wherein R is hydrogen or alkyl of 1 to 2 carbon atoms, inclusive; wherein R_1 is alkyl of 1 to 3 carbon atoms, inclusive, or



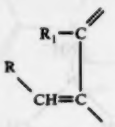
is a 2-cycloalkenylidene ring of 5 or 6 carbon atoms; wherein R_2 is hydrogen, methyl or ethyl; wherein R_3 is hydrogen, fluoro, chloro, bromo, nitro and $—CF_3$; and wherein Ar is phenyl, o-chlorophenyl, o-fluorophenyl, 2,6-difluorophenyl, and 2-pyridyl, or the pharmacologically acceptable acid addition salts thereof.

15. A process for the production of a compound of formula IV:

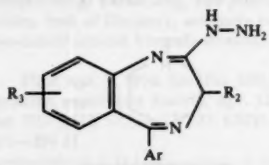


IV

wherein R is hydrogen or alkyl of 1 to 2 carbon atoms, inclusive; wherein R_1 is alkyl of 1 to 3 carbon atoms, inclusive, or

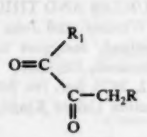


is a 2-cycloalkenylidene of 5 or 6 carbon atoms, inclusive; wherein R_2 is hydrogen, methyl or ethyl; wherein R_3 is hydrogen, fluoro, chloro, bromo, nitro and $-CF_3$; and wherein Ar is phenyl, o-chlorophenyl, o-fluorophenyl, 2,6-difluorophenyl, and 2-pyridyl, which comprises: treating a hydrazino compound of the formula:



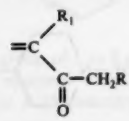
I

with a dicarbonyl compound II

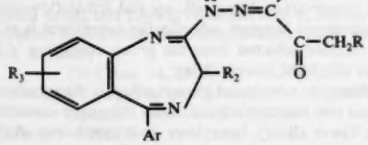


II

wherein R and R_1 are defined as above, or the group

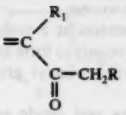


is 2-oxocyclopentylidene or 2-oxocyclohexylidene to give compound III



III

wherein R, R_1, R_2, R_3 and



are defined as above, and treating compound II with a cyclizing agent to obtain the compound of formula IV.

4,073,786

2-AMINO-4-HYDROXY-6-HYDROXYMETHYL-7,7-DIETHYL-7,8-DIHYDROPTERIDINE AND THE 7-SPIROCYCLOHEXYL ANALOGUE THEREOF

Hamish Christopher Swan Wood, Bearsden, Scotland, and Irene Stirling, Worcester Park, England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 383,698, July 30, 1973, Pat. No. 3,963,719. This application July 31, 1975, Ser. No. 600,921

Int. Cl.[2] C07D *475/04*

U.S. Cl. 260—251.5 **4 Claims**

1. 2-amino-4-hydroxy-6-hydroxymethyl-7,7-diethyl-7,8-dihydropteridine or a tautomeric form thereof.

3. 2-amino-4-hydroxy-6-hydroxymethyl-7-spirocyclohexyl-7,8-dihydropteridine or a tautomeric form thereof.

4,073,787

MANUFACTURE OF PYRIDINE AND METHYLPYRIDINES

John Irvine Darragh, Runcorn, and Hugh Stewart Inglis, Stockton-on-Tees, both of England, assignors to Imperial Chemical Industries Limited, United Kingdom

Filed Jan. 17, 1977, Ser. No. 760,145

Claims priority, application United Kingdom, Jan. 30, 1976, 3789/76

Int. Cl.[2] C07D *213/12*

U.S. Cl. 260—290 P **5 Claims**

1. A process for the manufacture of pyridine which comprises the vapor-phase reaction, in the presence of a catalyst comprising silica-alumina and at a temperature in the range from 300° C to 550° C, of 1,3-butadiene, formaldehyde and ammonia in the presence of a gaseous diluent comprising steam wherein the proportions of the reactants are at least 0.5 mole of ammonia per total mole of formaldehyde and butadiene and at least 0.2 mole of formaldehyde per mole of butadiene and wherein the proportion of steam is at least 3 moles of steam per total mole of formaldehyde and butadiene.

4,073,788

PARTIALLY IMIDIZED POLYAMIDE-ACID POLYMERS, AQUEOUS COATING COMPOSITIONS, COATED WIRE AND METHOD, AND PARTIALLY IMIDIZED INTERMEDIATE

Marvin A. Peterson, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Continuation of Ser. No. 822,899, May 8, 1969, abandoned, and a continuation of Ser. No. 324,987, Jan. 19, 1973, abandoned. This application May 6, 1974, Ser. No. 467,615

Int. Cl.[2] C08J *3/06*

U.S. Cl. 260—29.2 N **36 Claims**

1. In a process for producing a high solids content polyamide acid solution for use in the preparation of a coating medium for applying a curable polyamide acid coating on magnet wire which includes the steps of reacting in a solvent an aromatic dianhydride reactant with an aromatic diamine reactant to produce a solution of a polyamide acid polymer wherein said reactants are present in approximately equal molar quantities, the improvement comprising:

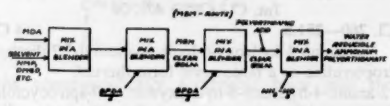
(a) forming an anhydrous mixture of an aromatic dianhydride reactant and an aromatic diamine reactant in an

organic solvent wherein the reactants are in the molar ratio of about two-to-one;

(b) reacting said reactants at a temperature below that at which imidization occurs to form an amide acid intermediate having two free carboxyl groups each ortho to an amide group;

(c) partially imidizing said amide acid intermediate to an imidization level greater than a negligible amount up to but not more than 56% to provide the desired viscosity of the final polyamide acid polymer solution;

(d) further reacting said amide acid intermediate with a reactant of the character of the original reactant initially present in the lesser amount with said additional reactant being in a molar amount equal to the molar amounts of said lesser initial reactant;



(e) the total amounts of dianhydride reactant and diamine reactant being sufficient to produce a polyamide acid polymer solution having a solids content of between about 25% and about 70% by weight.

33. A stable amide acid intermediate composition for use in preparing a high solids content polyamide acid coating composition, comprising the reaction product of an aromatic diamine reactant and an aromatic dianhydride reactant in an anhydrous organic solvent, wherein the reactants are in the molar ratio of about two moles of one reactant to about one mole of the other and wherein said product is partially imidized to a level greater than a negligible amount up to but not more than 56% to provide the desired viscosity of the high solids content polyamide acid coating composition.

4,073,789

INDOLOBENZOXAZEPINES

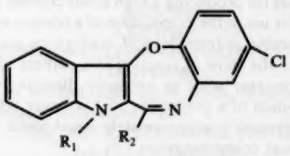
Richard E. Brown, Hanover, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 627,159, Oct. 30, 1975, Pat. No. 4,013,660. This application Nov. 2, 1976, Ser. No. 737,969

Int. Cl.[2] C07D *491/00*

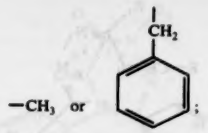
U.S. Cl. 260—293.58 **8 Claims**

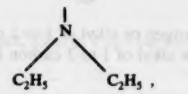
1. A compound of the formula:

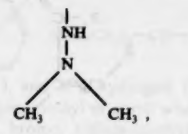


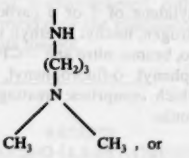
I

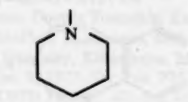
wherein R_1 is











4,073,790

PIPERIDINO UREAS AND THIOUREAS

John Leheup Archibald, Windsor, and John Lambert Jackson, Exmouth, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

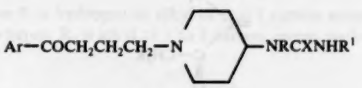
Filed Feb. 12, 1975, Ser. No. 549,271

Claims priority, application United Kingdom, Feb. 18, 1974, 7278/74

Int. Cl.[2] C07D *211/58*

U.S. Cl. 260—293.73 **15 Claims**

1. A compound of the formula:



in which

R is hydrogen or lower alkyl;

R^1 is hydrogen, lower alkyl, cyclohexyl, benzyl, phenyl, benzoyl, substituted phenyl wherein the substituent is at least one member selected from the group consisting of halo, lower alkyl, lower alkoxy and trihalo(lower)alkyl, or substituted benzoyl wherein the substituent is at least one member selected from the group consisting of halo, lower alkyl and lower alkoxy;

Ar is phenyl or substituted phenyl wherein the substituent is at least one member selected from the group consisting of halo, lower alkoxy, benzyloxy, hydroxy, lower alkyl and triflouromethyl);

X is oxygen or sulphur;

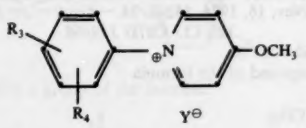
or a pharmaceutically acceptable acid addition or quaternary ammonium salt thereof.

4,073,791
1-SUBSTITUTEDPHENYL-4(1H)-PYRIDINONE HYDRAZONES

Michael H. Fisher, Bridgewater, and William V. Ruyle, Scotch Plains, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 19, 1976, Ser. No. 743,388
Int. Cl.[2] C07D *213/04*
U.S. Cl. 260—294.8 R **3 Claims**

1. The compound having the structure:



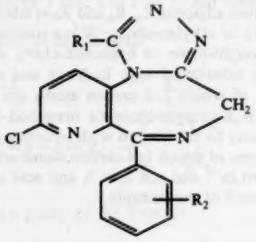
wherein R_3 is halogen, haloalkyl, alkylthio or cyano wherein the alkyl group contains 1 to 3 carbon atoms; R_4 is hydrogen or halogen; and Y is SO_3F or CH_3OSO_3.

4,073,792
5-ARYL-PYRIDO-(b-6,7)-1,4-DIAZAEPINE WITH AN ADDITIONAL FUSED HETEROCYCLIC RING

Walter vonBebenburg, Buchschlag, and Heribert Offermanns, Grossauheim, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler, Frankfurt, Germany

Filed Apr. 9, 1974, Ser. No. 459,371
Claims priority, application Austria, Apr. 12, 1973, 3241/73
Int. Cl.[2] A61K *31/55, 31/625;* C07D *471/14*
U.S. Cl. 260—296 H **6 Claims**

1. A 5-arylpyrido-(b,6,7)-1,4-diazepine of the formula:



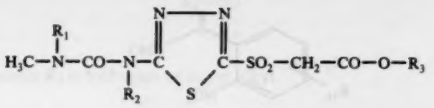
where R_1 is an alkyl group of 1 to 6 carbon atoms and R_2 is hydrogen or halogen of atomic weight 19 to 80 or the tautomeric form thereof or a pharmacologically acceptable salt thereof.

4,073,793
5-ALKYLUREIDO-1,3,4-THIADIAZOL-2-YL-SULFONYL-ACETIC ACID DERIVATIVES

Friedrich Arndt, and Ludwig Nüsslein, both of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

Filed Jan. 14, 1977, Ser. No. 759,558
Claims priority, application Germany, Jan. 16, 1976, 2601988
Int. Cl.[2] A01N *9/12;* C07D *285/12*
U.S. Cl. 260—306.8 D **5 Claims**

1. (5-alkylureido-1,3,4-thiadiazol-2-ysulfonyl) acetic acid derivatives of the general formula



in which R_1 and R_2 are hydrogen or methyl and R_3 is hydrogen alkyl of 1 to 4 carbon atoms, a univalent metal equivalent selected from the group consisting of Na, K, Ca/2, Mg/2 and NH_4, an ammonium group or an alkyl ammonium group selected from the group consisting of triethylammonium, tris-(2-hydroxy-(ethyl)-ammonium, tetramethylammonium and tetrabutylammonium.

4,073,794
7,8 DIACYL BICYCLO[2.2.2]BIS(2,3-DICARBOXIMIDE) COMPOUNDS

Steven A. Cerefice, Naperville, and Ellis K. Fields, River Forest, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 18, 1976, Ser. No. 733,118
Int. Cl.[2] C07D *209/34*
U.S. Cl. 260—326 C **4 Claims**

1. A compound selected from the group consisting of 7,8-diacyl bicyclo[2.2.2]oct-5-ene-bis(2,3-dicarboximide) and 7,8-diacyl bicyclo[2.2.2]octane-bis(2,3-dicarboximide).

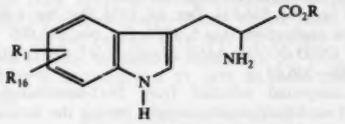
4,073,795
SYNTHESIS OF TRYPTOPHANS

Andrew David Batcho, North Caldwell; Urs Oskar Hengartner, Roseland; Willy Leimgruber; John William Scott, both of Upper Montclair, and Donald Valentine, Jr., Highland Park, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed June 22, 1976, Ser. No. 698,573
Int. Cl.[2] C07D *209/20*
U.S. Cl. 260—326.14 T **11 Claims**

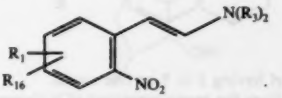
1. A process for the preparation of a compound of the formula:

I



wherein R_1 and R_{16} are halogen or lower alkyl, hydroxy, lower alkoxy, aralkyloxy, amino, trihalomethyl and hydrogen, and R is hydrogen or lower alkyl; which comprises reacting a compound of the formula:

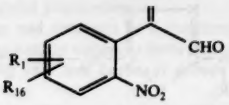
III



wherein R_1 and R_{16} are as above and R_3 is lower alkyl which may be taken together to form lower alkylene, which foramaldehyde/lower alkylamine to form a compound of the formula:

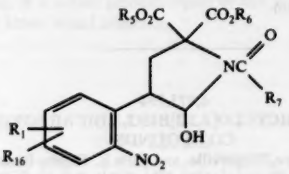
V

-continued



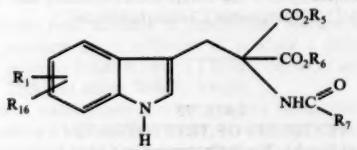
wherein R_1 and R_{16} are as above, followed by treatment of compound V with a lower acylamino malonate, in the presence of a base selected from the group consisting of ammonium hydroxide, alkali or alkaline earth metal hydroxides or alkoxides to form a compound of the formula:

VI



wherein R_1 and R_{16} are as above, R_5 and R_6 are hydrogen or lower alkyl, and R_7 is lower alkyl, hydrogen, aryl, halo-lower alkyl or alkyloxy; followed by reduction of compound VI to a compound of the formula:

VII



wherein R_1, R_2, R_6, R_7 and R_{16} are as defined above; followed by saponification and decarboxylation of compound VII; said decarboxylation being conducted in the presence of a lower alkyl monocarboxylic acid.

4,073,796

N-(1-SUBSTITUTED-3-PYRROLIDINYL)-1-NAPHTHALENE CARBOXAMIDES

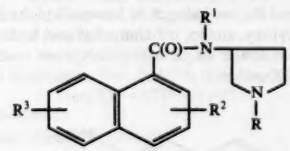
Albert Duncan Cale, Jr., Mechanicsville, Va., assignor to A. H. Robins Company, Inc., Richmond, Va.

Division of Ser. No. 536,514, Dec. 26, 1974, Pat. No. 4,002,757. This application May 5, 1976, Ser. No. 683,605

Int. Cl.[2] **C07D** *207/14;* **A61K** *31/40, 31/47;* **C07D** *401/12*

U.S. Cl. 260—326.33 **5 Claims**

1. A compound selected from N-(1-substituted-3-pyrrolidinyl)-1-naphthalenecarboxamides having the formula:



wherein;

R is cycloalkyl having 3 to 9 carbon atoms,

R^1 is selected from the group consisting of hydrogen, lower-alkyl having 1 to 8 carbon atoms, phenyl or substituted phenyl wherein one to three substituents are selected from halogen atoms of atomic weight less than 80, lower-alkyl having 1 to 8 carbon atoms, lower-alkoxy having 1 to 8 carbon atoms,

R^2 is selected from the group consisting of hydrogen, lower-alkyl having 1 to 8 carbon atoms, halogen of atomic weight less than 80, lower alkoxy having 1 to 8 carbon atoms, amino or nitro,

R^3 is selected from the group consisting of hydrogen, lower-alkyl having 1 to 8 carbon atoms, lower-alkoxy having 1 to 8 carbon atoms, halogen atom of atomic weight less than 80, amino or nitro and the pharmaceutically acceptable acid addition salts thereof.

4,073,797

SULPHUR CONTAINING DERIVATIVES

Henri Ramuz, Birsfelden, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 532,990, Dec. 16, 1974, Pat. No. 4,003,914. This application Oct. 1, 1976, Ser. No. 728,668

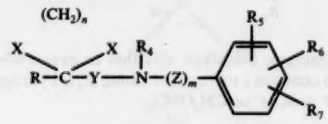
Claims priority, application Switzerland, Dec. 21, 1973, 18030/73; Nov. 16, 1974, 15248/74

Int. Cl.[2] **C07D** *339/08*

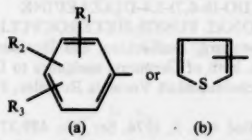
U.S. Cl. 260—327 M **6 Claims**

1. A compound of the formula

(I)



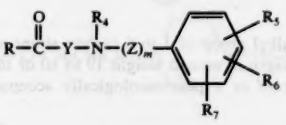
wherein R is a group of the formula



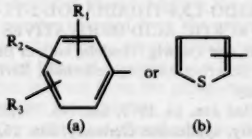
in which two adjacent R_1, R_2 and R_3 symbols together are methylenedioxy, ethylenedioxy or butadien-1,3-ylene-1,4; R_4 is hydrogen or lower alkyl; R_5, R_6 and R_7 each independently is hydrogen, halogen, lower alkyl, lower alkoxy, hydroxy or benzyloxy or two adjacent R_5, R_6 and R_7 symbols together are methylenedioxy or ethylenedioxy; X is a sulphur atom, SO or SO_2; Y is a straight-chain or branched-chain, aliphatic group which may be substituted with hydroxy and containing 2–8 carbon atoms, of which 2–4 carbon atoms are present in the chain; and Z is a straight-chain or branched-chain aliphatic group which may be substituted with hydroxy and containing 1–8 carbon atoms, of which 1–4 carbon atoms are present in the chain; *m* is zero or 1 and *n* is 2 or 3, and acid salts thereof.

4. A compound of the formula

(IV)



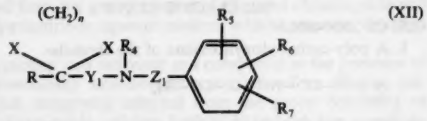
wherein R is a group of the formula



in which two adajcent R_1, R_2 and R_3 symbols together are methylenedioxy, ethylenedioxy or butadien-1,3-xylene-1,4; R_4 is hydrogen or lower alkyl; R_5, R_6 and R_7 each independently

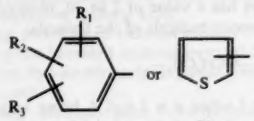
is hydrogen, halogen, lower alkyl, lower alkoxy, hydroxy or benzyloxy or two adjacent R_5, R_6 and R_7 symbols together are methylenedioxy or ethylenedioxy; y is a straight-chain or branched-chain, optionally hydroxy-substituted, aliphatic group containing 2–8 carbon atoms, of which 2–4 atoms are present in the chain, and Z repesents a straight-chain or branched-chain, optionally hydroxy-substituted aliphatic group containing 1–8 carbon atoms, of which 1–4 carbon atoms are present in the chain, and *m* stands for zero or 1, and acid addition salts thereof.

5. A compound of the formula



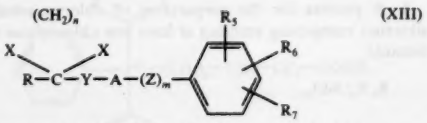
(XII)

wherein R is a group of the formula



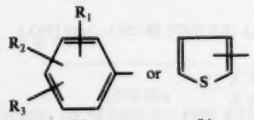
in which two adjacent R_1, R_2 and R_3 symbols together are methylenedioxy, ethylenedioxy or butadien-1,3-ylene1,4; R_4 is hydrogen or lower alkyl; R_5, R_6 and R_7 each independently is hydrogen, halogen, lower alkyl, lower alkoxy, hydroxy, or benzyloxy or two adjacent R_5, R_6 and R_7 symbols together are methylenedioxy or ethylenedioxy; X is a sulphur atom, SO or SO_2; Y_1 is a straight-chain or branched-chain aliphatic group which may be substituted with hydroxy and containing 2–8 carbon atoms, of which 2–4 carbon atoms are present in the chain; Z_1 is a straight-chain or branched-chain, aliphatic group which may be substituted with carbonyl and containing 1–8 carbon atoms, of which 1–4 carbon atoms are present in the chain; *m* is zero or 1 and *n* is 2 or 3, and acid addition salts thereof.

6. A compound of the formula



(XIII)

wherein R is a group of the formula



in which two adjacent R_1, R_2, and R_3 symbols together are methylenedioxy, ethylenedioxy or butadien-1,3-ylene-1,4; R_5, R_6 and R^7 each independently is hydrogen, halogen, lower alkyl, lower alkoxy, hydroxy or benzyloxy ot two adjacent R_5, R_6 and R_7 symbols together are methylenedioxy or ethylenedioxy; X is a sulphur atom, SO or SO_2; Y is a straight-chain or branched-chain aliphatic group which may be substituted with hydroxy and containing 2–8 carbon atoms, of which 2–4 carbon atoms are present in the chain; Z is a straight-chain or branched-chain aliphatic group which may be substituted with hydroxy and containing 1–8 carbon atoms, of which 1–4 carbon atoms are present in the chain; *m* is zero of 1; *n* is 2 or 3 and A is the group

wherein R_4 is hydrogen or lower alkyl.

4,073,798

PREPARATION OF ETHYLAMINE DERIVATIVES

John T. Suh, Mequon, Wis., assignor to Nicholas International Limited, Australia

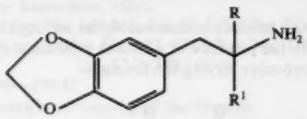
Filed Nov. 19, 1976, Ser. No. 743,400

Claims priority, application United Kingdom, Nov. 27, 1975, 48709/75

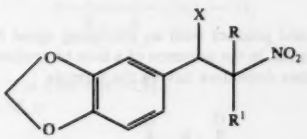
Int. Cl.[2] C07D *317/44*

U.S. Cl. 260—340.5 R **4 Claims**

1. A process for preparing a compound of formula I



wherein R and R^1 independently are selected from hydrogen and C_1–C_4 alkyl groups, which comprises catalytically hydrogenating under super-atmospheric pressure and at above ambient temperature a compound of formula (IV)



wherein R and R^1 are defined above and X is halogen using platinum oxide as catalyst.

4,073,799

PROCESS FOR PRODUCING 3-FORMYLCYCLOPENTANONE DERIVATIVES

Kiyoshi Kondo, Yamato; Daiei Tunemoto, Sagamihara, and Etsuko Hiro, Tokyo, all of Japan, assignors to (Zaidanhojin) Sagami Chemical Research Center, Tokyo, Japan

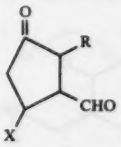
Filed Feb. 25, 1976, Ser. No. 661,263

Claims priority, application Japan, Feb. 27, 1975, 50-23451; Feb. 27, 1975, 50-23452; Feb. 27, 1975, 50-23453; Feb. 27, 1975, 50-23456

Int. Cl.[2] C07C *69/74, 49/40*

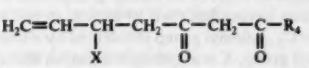
U.S. Cl. 260—345.8 P **1 Claim**

1. A process for producing a 3-formylcyclopentanone derivative having the formula

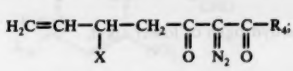


which comprises:

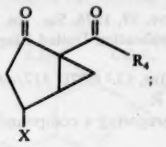
reacting a β-dicarbonyl compound having the formula



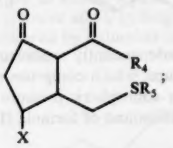
with an azide under basic conditions to produce an α-diazo-β-dicarbonyl compound having the formula



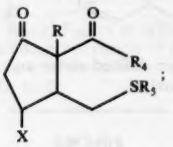
treating said product under conditions suitable for producing a carbene or carbenoid to produce a bicyclo hexane-2-one derivative having the formula:



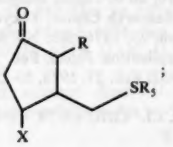
reacting said product with a mercaptan having the formula, R_5SH, in the presence of a base to produce a cyclopentanone derivative having the formula



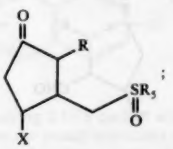
reacting said product with an alkylating agent having the formula RZ in the presence of a base to produce a cyclopentanone derivative having the formula



decarboxylating said product to produce a cyclopentane sulfide derivative having the formula



oxidizing said product to produce a cyclopentanone sulfoxide derivative having the formula



reacting said product with an acid anhydride; and

treating the obtained product with an acid or a base;

wherein R_4 is an alkyl or an alkoxy group; R_5 is a hydrocarbon group having less than 10 carbon atoms; R is a $C_{1\text{-}10}$ alkyl or $C_{2\text{-}10}$ alkenyl group substituted by a lower alkoxycarbonyl group, X is a hydrogen atom, an alkoxy group, a tetrahydropyranyloxy group or a silyloxy group; and Z is a leaving anion.

4,073,800

POLY-CARBONYLOXYURETHANES

John Langshaw Brooks, and Richard Budziarek, both of Blackley, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Feb. 23, 1976, Ser. No. 660,117

Claims priority, application United Kingdom, Mar. 26, 1975, 12677/75

Int. Cl.² C07C *125/06*

U.S. Cl. 260—404.5 **7 Claims**

1. A poly-carbonyloxyurethane of the formula:

$$A + O—CO—NH—O—CO—R]_n \quad (I)$$

wherein n is 2 or 3, A is a linking group to which the oxygen atoms are attached through carbon atoms, A being selected from the class consisting of alkylene radicals of formula $(CH_2)_m$ where m has a value of 2 to 10, phenylene, xylylene, and polyethyleneoxy radicals of the formula:

$$— CH_2CH_2—OCH_2CH_2—_p$$

where p is 1 or 2 when n is 2 and A being selected from the class consisting of tri(ethylene)amino and tri(methylenepropane) when n is 3, and each R, which may be the same or different, is selected from the class consisting of alkyl radicals of 1 to 17 carbon atoms, phenyl, dimethylaminophenyl, nitrophenyl, hydroxyphenyl, chlorophenyl and tolyl.

4,073,801

PROCESS FOR THE PREPARATION OF LINEAR AND BRANCHED CHLOROSILOXANES

Hans-Heinrich Moretto; Armand de Montigny, both of Leverkusen; Karl-Friedrich Thom, and Reinhard Schliebs, both of Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 30, 1975, Ser. No. 627,302

Claims priority, application Germany, Nov. 12, 1974, 2453482

Int. Cl.² C07F *7/08*

U.S. Cl. 260—448.2 E **6 Claims**

1. A process for the preparation of chlorine-substituted siloxanes comprising reacting at least one chlorosilane of the formula

$$R_a R_b' SiCl_{(4-a-b)}$$

or a partial hydrolysis product thereof, with at least one siloxane having structural units selected from the group consisting of

$$[R_2R''SiO_{1/2}],\ [RR''SiO],\ [R''SiO_{3/2}] \text{and } [SiO_2]$$

wherein

$a = 0, 1, 2$ or 3,

$b = 0, 1, 2$ or 3,

$a + b \leqq 3$,

R and R′ each independently is hydrogen or an aliphatic, aromatic, araliphatic, saturated or unsaturated, optionally halogen-substituted or cyano-substituted, monovalent hydrocarbon radical with up to 18 C atoms,

R″ is chlorine or hydroxyl or has the meaning indicated for R and R′,

at least one of R, R′, and R″ being an organo group, and the number of Si—Cl groups exceeds the number of all Si—OH groups,

the reaction being carried out at about −10° to 200° C in the presence of about 0.1 to 3% by weight of the reaction mixture of each of (i) at least one protonic acid equilibration catalyst for siloxanes and (ii) a hydrogen halide acid.

4,073,802
PROCESS FOR THE PREPARATION AND PURIFICATION OF 3-(4-LITHIOSULFOPHENOXY)-1,2-PROPANEDIOL

Ludwig Albert Hartmann, and Richard Lowell West, both of Wilmington, Del., assignors to ICI Americas Inc., Wilmington, Del.

Filed Sept. 16, 1976, Ser. No. 724,028
Int. Cl.² C07C *143/46*
U.S. Cl. 260—512 R **8 Claims**

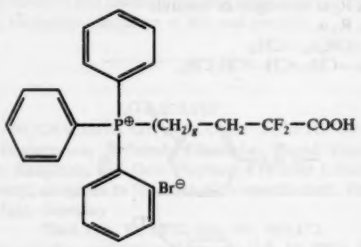
1. The process for preparing 3-(4-lithiosulfophenoxy)-1,2-propanediol from lithium p-phenolsulfonate and a compound selected from the group consisting of glycol chlorohydrin and epichlorohydrin in aqueous medium which comprises the steps of:
   (1) reacting said sulfonate and compound in the presence of substantially stoichiometric amounts of an alkaline calcium compound selected from the group consisting of calcium oxide, calcium hydroxide and calcium acetate to form by-product calcium chloride and 3-(4-lithiosulfophenoxy)-1,2-propanediol,
   (2) forming calcium sulfate and liberated hydrochloric acid by the addition of sulfuric acid,
   (3) removing precipitated calcium sulfate,
   (4) removing the liberated hydrochloric acid from the aqueous medium by vacuum-stripping until a semi-solid mass is obtained, and
   (5) recovering relatively pure 3-(4-lithiosulfophenoxy)-1,2-propanediol product from said semi-solid mass substantially free of chloride ion by recrystallization.

4,073,803
TRIPHENYLPHOSPHONIUM BROMIDE INTERMEDIATE FOR 2,2-FLUORO-PG ANALOGS

Udo F. Axen, Plainwell, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 552,708, Feb. 24, 1975, Pat. No. 4,001,300.
This application Sept. 17, 1976, Ser. No. 724,154
Int. Cl.² C07F *9/54*
U.S. Cl. 260—515 A **1 Claim**

1. A phosphonium salt of the formula



wherein *g* is 2 to 4, inclusive.

4,073,804
PRODUCING GLYCINE BY THE REDUCTIVE AMINATION OF GLYOXYLIC ACID

William Montgomery Hearon, Portland, Oreg., and Lo Cheng Fan, Vancouver, Wash., assignors to Boise Cascade Corporation, Portland, Oreg.

Filed May 4, 1976, Ser. No. 682,831
Int. Cl.² C07C *99/00, 101/06*
U.S. Cl. 260—534 R **9 Claims**

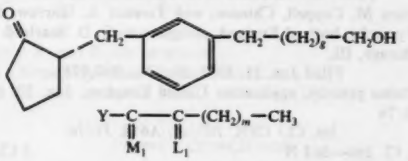
1. The process for the production of glycine which comprises:
   a. forming a solution of glyoxylic acid, ammonia, water and a water-soluble organic solvent,
      1. the ammonia being used in an amount of at least 2 mols of ammonia per mol of glyoxylic acid,
      2. the solvent being used in an amount sufficient to substantially dissolve the glyoxylic acid, ammonia and water; the intermediate reaction products of glyoxylic acid with ammonia; and the glycine product,
   b. hydrogenating the solution in an atmosphere of hydrogen in the presence of a metallic rhodium hydrogenation catalyst for a time sufficient to convert a substantial proportion of the glyoxylic acid to glycine, and
   c. separating the glycine product from the resulting reaction mixture.

4,073,805
2-DECARBOXY-2-HYDROXYMETHYL-3,7-INTER-M-PHENYLENE-11-DEOXY-PGE$_1$ COMPOUNDS

Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,363, Jan. 8, 1976, Pat. No. 4,028,419.
This application Mar. 17, 1977, Ser. No. 778,756
Int. Cl.² C07C *49/82*
U.S. Cl. 260—590 C **22 Claims**

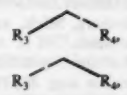
1. A prostaglandin analog of the formula



wherein Y is trans-CH=CH-;
wherein M_1 is

or

wherein R_5 is hydrogen or methyl;
wherein L_1 is



or a mixture of

and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein *g* is 1, 2, or 3; and
wherein *m* is 1 to 5, inclusive.

4,073,806

PROCESS FOR THE PREPARATION OF PHOSGENE

Serge Doubovetzky; Peter Forschner, both of Toulouse, and Francois Montazeau, Portet sur Garonne, all of France, assignors to Societe Touloussaine de Produits Chimiques "Tolochimie", Courbevoie, France

Filed Dec. 31, 1975, Ser. No. 645,938
Claims priority, application France, Jan. 8, 1975, 75.01201
Int. Cl.[2] C07C *51/58*
U.S. Cl. 260—544 K 13 Claims

1. A process for the preparation of phosgene which comprises catalytically interreacting chlorine and carbon monoxide gases in plural stages wherein the chlorine requirement and at least some but less than all of the carbon monoxide requirement is introduced to a first stage reaction zone, with the remaining required carbon monoxide being introduced to at least one downstream reaction zone, said at least one downstream reaction zone being in serial communicating relationship with said first stage reaction zone.

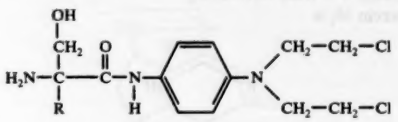
4,073,807

PROPIONAMIDE ANTITUMOR AGENTS

Stephen M. Coppell, Chinnor, and Terence A. Harrow, High Wycombe, both of England, assignors to G. D. Searle & Co., Chicago, Ill.

Filed Jan. 21, 1977, Ser. No. 760,871
Claims priority, application United Kingdom, Jan. 23, 1976, 2654/76
Int. Cl.[2] C07C *103/44*; A61K *31/16*
U.S. Cl. 260—562 N 3 Claims

1. A compound of the formula



wherein R is hydrogen or hydroxymethyl.

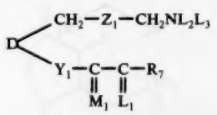
4,073,808

2-DECARBOXY-2-AMINO-METHYL-PGA AND 9-DEOXY-9,10-DIDEHYDRO-PGD ANALOGS

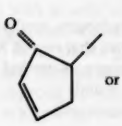
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 645,276, Dec. 29, 1975, abandoned. This application Aug. 30, 1976, Ser. No. 719,055
Int. Cl.[2] C07C *87/24*; A61K *31/13, 31/135*
U.S. Cl. 260—563 R 11 Claims

1. A prostaglandin analog of the formula



wherein D is



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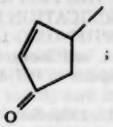
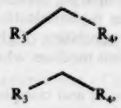
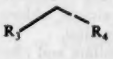


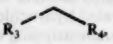
wherein L_1 is



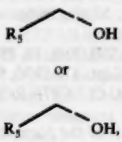
or a mixture of



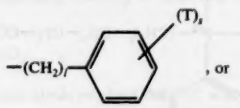
and



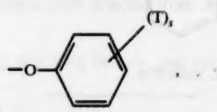
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein L_2 and L_3 are hydrogen or alkyl of one to 4 carbon atoms, inclusive;
wherein M_1 is



wherein R_5 is hydrogen or methyl;
wherein R_7 is
(1) $-(CH_2)_m-CH_3$,
(2) cis—CH=CH—CH_2CH_3,



(3)

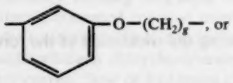


(4)

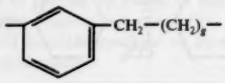
wherein 1 is zero to three, inclusive, wherein *m* is one to 5, inclusive, s is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, or alkoxy of one to 3 carbon atoms, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;
wherein Y_1 is
(1) trans—CH=CH—,
(2) cis—CH=CH—,
(3) $-CH_2CH_2-$, or
(4) —C≡C—; and
wherein Z_1 is
(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(3) cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—,

(4) $-(CH_2)_3-(CH_2)_g-CH_2-$,
(5) $-(CH_2)_3-(CH_2)_g-CF_2-$,
(6) $-CH_2-O-CH_2-(CH_2)_g-CH_2-$,
(7) $-(CH_2)_2-O-(CH_2)_g-CH_2-$,
(8) $-(CH_2)_3-O-(CH_2)_g-$,

(9)



(10)



wherein g is zero, one, two, or three.

4,073,809
METHOD FOR PRODUCING TRIALKYLPHOSPHINE OXIDES

Jury Vasilievich Kandul, bulvar Lesi Ukrainki, 8, kv. 3; Valery Yakovlevich Semeny, ulitsa A.Navoi, 57, kv. 27; Mikhail Danilovich Pivovarov, ulitsa Sh.Aleikhema, 19, kv. 68; Vladlen Vasilievich Malovik, ulitsa A.Malyshko, 33, kv. 125; Ivan Karpovich Mazepa, ulitsa A.Dovbusha, 12, and Ninel Gavrilovna Feschenko, ulitsa E.Potie, 11, kv. 67, all of Kiev, U.S.S.R.

Filed May 26, 1976, Ser. No. 689,980
Int. Cl.[2] C07F 9/53
U.S. Cl. 260—606.5 P **3 Claims**

1. A method for producing a trialkylphosphine oxide having the formula R_3PO, where R is an alkyl having from 1 to 16 carbon atoms, comprising reacting red phosphorus with an alkyl iodide where the alkyl group has from 1 to 16 carbon atoms in the presence of a catalyst selected from the group consisting of iodine and hexaalkyliodophosphoranphosphonium pentaiodide, by gradually adding alkyl iodide to the reaction mixture and maintaining the temperature at 180°-230° C, with subsequent isolation of the end product.

4,073,810
PRODUCTION OF ORGANOPHOSPHINES

Klaus Hestermann, Erftstadt Bliesheim; Bernd Lippsmeier, Hurth-Knapsack, and Gero Heymer, Erftstadt Liblar, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 12, 1975, Ser. No. 549,172
Claims priority, application Germany, Feb. 16, 1974, 2407461
Int. Cl.[2] C07F 9/50, 9/54
U.S. Cl. 260—606.5 P **18 Claims**

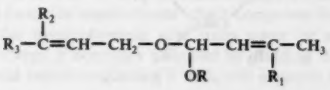
1. In the process for making organophosphines of the formula R_nPH_{3-n}, in which R is alkyl having from 1 to 4 carbon atoms, and *n* is a whole numnber of 1 to 3, the improvement which comprises continuously reacting hydrogen phosphide as starting material with alkyl halide of the formula RX, in which R has the meaning given hereinabove and X is chlorine or bromine, at temperatures of 100° to 600° C within a gas atmosphere inert to the reaction mixture and under pressure of up to 20 atmospheres in contact with a catalyst in a reactor for a period within the range 0.1 and 60 seconds wherein the catalyst is selected from the group consisting of active carbon, a finely divided metal from the first or eighth subgroup of the Periodic System of the elements and blends of such metals; cooling gaseous matter issuing from the reactor; and hydrolyzing the resulting organophosphonium halides $(R_nPH_{4-n})X$ to the corresponding organophosphines.

4,073,811
PROCESS FOR THE PREPARATION OF ALDEHYDES

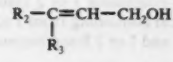
Willy Leimgruber, Montclair, and Donald Herman Valentine, Jr., Westfield, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 442,991, Feb. 15, 1974, Pat. No. 4,016,212, which is a continuation-in-part of Ser. No. 340,496, March 12, 1973, abandoned. This application Dec. 30, 1976, Ser. No. 755,695
Int. Cl.[2] C07C 43/30, 41/06
U.S. Cl. 260—611 A **1 Claim**

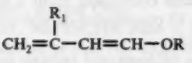
1. A process for forming an acetal of the formula:



wherein R_1 and R_2 are lower alkyl; R_3 is hydrogen, lower alkyl; and —OR is lower alkoxy or benzyloxy; comprising reacting at a temperature of from −35° to 50° C. an alcohol of the formula:



wherein R_2 and R_3 are as above;
with a butadienyl ether of the formula:



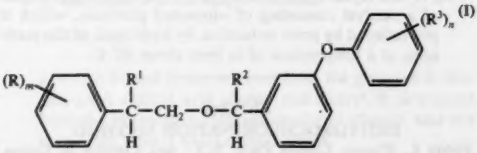
wherein R_1 and R are as above; said reaction being carried out in the presence of a dichloro-bis(benzonitrile) palladium or dichloro- phenanthroline palladium.

4,073,812
BENZYL ETHERS

Michael J. Bull, Lower Halstow, and Robert J. G. Searle, Sittingbourne, both of England, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 1, 1977, Ser. No. 773,355
Claims priority, application United Kingdom, Mar. 5, 1976, 8905/76
Int. Cl.[2] C07C 43/22
U.S. Cl. 260—613 R **2 Claims**

1. A compound of the formula:



(I)

wherein *m* is one or two, R is halogen, or is straight-chain or branched-chain alkyl or alkoxy of one to six carbon atoms, R^1 is branched-chain alkyl of three to six carbon atoms, R^2 is hydrogen or alkynyl of two to four carbon atoms, *n* is zero or 1, and R^3 is fluorine.

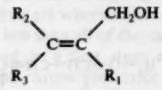
4,073,813

PROCESS FOR THE PREPARATION OF UNSATURATED ALCOHOLS

Georges Cordier, Francheville, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Oct. 18, 1976, Ser. No. 733,470
Claims priority, application France, Nov. 3, 1975, 75 34364
Int. Cl.[2] C07C *29/14*
U.S. Cl. 260—617 C 31 Claims

13. A process for the preparation of α,β-ethylenic alcohols of the general formula:



(I)

in which:

R_1 symbolizes hydrogen or:

(a) an alkyl radical having from 1 to 8 carbon atoms;

(b) a lower alkoxy radical;

(c) a cycloalkyl or cycloalkenyl radical containing from 5 to 6 carbon atoms;

(d) an aryl radical containing 1 or 2 fused benzene nuclei;

(e) an aralkyl radical containing from 1 to 2 carbon atoms in the alkyl radical and 1 or 2 fused benzene nuclei in the aryl radical.

R_2 and R_3 represent hydrogen or:

(a) alkyl radicals containing from 1 to 30 carbon atoms;

(b) lower alkoxy radicals;

(c) alkenyl radicals containing from 2 to 30 carbon atoms and from 1 to 12 conjugated or non-conjugated ethylenic double bonds;

(d) cycloalkyl or cycloalkenyl radicals containing from 5 to 8 carbon atoms;

(e) aryl radicals containing 1 or 2 fused or nonfused benzene nuclei;

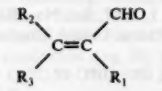
(f) aralkyl radicals containing from 1 to 5 carbon atoms in the alkyl radical and 1 or 2 fused or non-fused benzene nuclei;

(g) heterocyclic radicals with 5 or 6 chain members, containing a hetero-atom selected from the group consisting of sulphur, oxygen and nitrogen;

said R_2 and R_3 can form, with R_1, an aliphatic hydrocarbon ring containing from 5 to 7 carbon atoms and 1 or 2 ethylenic double bonds, a heterocyclic ring with 5 or 6 chain members,

and together, said R_2 and R_3, with the carbon atom to which they are bonded, can form an aliphatic hydrocarbon ring;

which process comprises hydrogenation of an α,β-ethylenic aldehyde of the general formula:



(II)

in which:

R_1, R_2 and R_3 have the meaning given above, in the presence of a catalyst consisting of supported platinum, which is pre-reduced by prior reduction, by hydrogen, of the platinum, at a temperature of at least about 50° C.

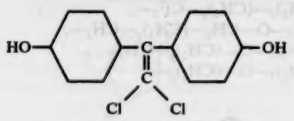
4,073,814

DEHYDROCHLORINATION METHOD

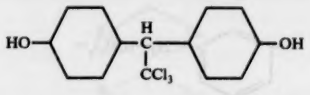
Philip L. Kinson, Clifton Park, N.Y., and Clayton B. Quinn, Mount Vernon, Ind., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 14, 1977, Ser. No. 768,209
Int. Cl.[2] C07C *37/00*
U.S. Cl. 260—619 A 10 Claims

1. A method for making the dichloride of the formula,



by dehydrochlorinating the trichloride of the formula,



which comprises,

(1) heating to a temperature in the range of 40° C to 120° C, a mixture containing as essential ingredients,

(a) the trichloride,

(b) a dipolar aprotic solvent,

(c) a basic halide-free alkali metal compound selected from sodium compounds and potassium compounds,

where, per 100 parts by weight of (b), there is present from 5 to 100 parts of (a), and per mole of (a), there is present at least 1.1 moles or molar equivalents of alkali metal of (c),

(2) adding water and a member selected from the class consisting of organic acid and mineral acid in amounts sufficient to produce a mixture comprising from 0.8 to 2 parts of water per part of dipolar aprotic solent,

(3) effecting the crystallization of dichloride crystals from the mixture of (2) at a temperature of from about 35° C to 120° C, and

(4) recovering the crystalline dichloride from the resulting mixture of (3).

4,073,815

PROCESS FOR THE PREPARATION OF 2,2-BIS(3,5-DI-T-BUTYL-4-HYDROXYPHENYL)PROPANE

John W. Cornforth, Lewes; John A. Schofield, Sittingbourne; Sidney J. French, Canterbury, all of England, and Robin T. Gray, Heemstede, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 19, 1976, Ser. No. 733,816
Claims priority, application United Kingdom, Oct. 21, 1975, 43140/75
Int. Cl.[2] C07C *37/00, 39/16*
U.S. Cl. 260—619 A 6 Claims

1. A process for producing 2,2-bis(3,5-di-t-butyl-4-hydroxyphenyl)propane which comprises contacting diphenylolpropane and isobutylene in a hydrocarbon solvent at a temperature between about 30° and about 70° C in the presence of a substantially anhydrous p-toluene sulfonic acid catalyst.

4,073,816

PROCESS FOR THE CONTINUOUS PRODUCTION OF MONOCHLOROALKANES

Rudolf Herrmann, Homberg, Ndrh., Germany, assignor to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Filed July 16, 1975, Ser. No. 596,330
Claims priority, application Germany, July 20, 1974, 2435029
Int. Cl.[2] C07C *17/16, 23/10*
U.S. Cl. 260—648 R 8 Claims

1. In a method for the continuous production of a monochloroalkane or a monochlorocycloalkane which comprises reacting a monohydric alcohol with hydrogen chloride in the presence of a zinc chloride catalyst, said monohydric alcohol being selected from the group consisting of monohydric alkanols and monohydric cycloalkanols having above 4 and up to 12 carbon atoms and said catalyst consisting of an aqueous solution of zinc chloride consisting of at least 50 weight per-

cent of zinc chloride, the improvement which comprises mixing said monohydric alcohol and said aqueous zinc chloride solution to form a liquid phase reaction mixture, saturating said reaction mixture with hydrogen chloride to form a liquid phase hydrogen chloride-saturated reaction mixture, passing said hydrogen chloride-saturated reaction mixture into a reactor to form a downwardly flowing thin layer of said liquid phase hydrogen chloride-saturated reaction mixture in said reactor, maintaining the temperature in said reactor above about 50° C, contacting said hydrogen chloride-saturated reaction mixture with a counter-current flow of hydrogen chloride gas in sufficient amount to provide an excess of said hydrogen chloride reactant in said reactor and recovering a reaction product containing said monochloroalkane or monochlorocycloalkane issuing from said reactor.

4,073,817
PROCESS FOR THE MANUFACTURE OF PERFLUOROALKYL IODIDE-OLEFINE ADDUCTS

Horst Jäger, Bettingen, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

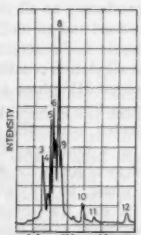
Continuation-in-part of Ser. No. 172,574, Aug. 17, 1971, abandoned. This application Dec. 2, 1974, Ser. No. 528,621
Claims priority, application Switzerland, Aug. 24, 1970, 12590/70
Int. Cl.² C07C *17/28*
U.S. Cl. 260—653.1 T **19 Claims**

1. Process for the manufacture of perfluoroalkyl iodide olefin adducts, which comprises reacting a) a linear or branched perfluoroalkyl mono- or di-iodide with 6 to 24 carbon atoms with b) a C_2-C_{12} alkene or C_2-C_{12} alkene substituted with a member selected from the group consisting of halogen a lower alkyl, wherein the carbon atoms of the olefinic double bond have at least two hydrogen atoms and wherein the alkene chain is linear or cyclic, in the presence of c) a basic primary, secondary or tertiary alkanol amine having 2 to 6 carbon atoms, and d) a halide, a sulphate, a cyanide, or an alcoholate of a metal of groups Ia to IVa or Ib to Vb and VIII of the periodic system, as catalyst pair, at 0° to 350° C and 0 to 200 atmospheres gauge.

4,073,818
PROCESS OF PRODUCING ACENAPHTHENES

Hiroshi Ichikawa; Michio Sugimoto; Shigeyoshi Mizokami; Kosaku Honna, and Hirozo Sugahara, all of Sodegaura, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 661,731, Feb. 26, 1976, abandoned. This application Mar. 28, 1977, Ser. No. 782,038
Int. Cl.² C07C *15/20*
U.S. Cl. 260—668 F **15 Claims**



1. A process of producing an acenaphthene which comprises contacting a reaction charge consisting essentially of cyclododecatriene with a zeolite ion-exchanged with ions of one or more metals selected from the group consisting of an alkaline earth metal, a metal of the manganese group and a rare earth metal.

4,073,819
2,6-DIMETHYLNAPHTHALENE EXTRACTION PROCESS

Walter H. Seitzer, West Chester, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed June 17, 1977, Ser. No. 807,697
Int. Cl.² C07C *7/01*
U.S. Cl. 260—674 N **5 Claims**

1. In a process for the separation of 2,6-dimethylnaphthalene from isomeric mixtures containing the same by selective clathrate complexation of said 2,6-dimethylnaphthalene with m-nitrobenzoic acid, followed by separation and breaking of the complex to recover said 2,6-dimethylnaphthalene in concentrated form, the improvement which comprises first recrystallizing the m-nitrobenzoic acid from water or a suitable organic solvent, if necessary followed by grinding the recrystallized acid before contacting it with said isomeric mixture.

4,073,820
OLEFIN METATHESIS PROCESS

Jin-Liang Wang; Melvin Brown, both of Akron, and Henry R. Menapace, Stow, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 584,244, June 5, 1975, abandoned, which is a continuation of Ser. No. 252,178, May 11, 1972, abandoned, which is a continuation-in-part of Ser. No. 99,258, Dec. 17, 1970, abandoned. This application Nov. 11, 1976, Ser. No. 740,902
Int. Cl.² C07C *3/62*
U.S. Cl. 260—683 D **2 Claims**

1. An olefin metathesis process which comprises forming olefins containing a higher number of carbon atoms and a lower number of carbon atoms and the same number of double bonds per olefin than the original olefin feed, by subjecting at least one olefin feed to a catalyst system consisting of

1. tungsten halides or the reaction product of these tungsten halides with carboxylic acid, phenols and 1,3-diketones,
2. a material selected from the group represented by the formulae:

$$R_{3-n}AlX_n$$

and

$$R_3Al_2X_3$$

wherein R is an alkyl radical containing from 1 to 12 carbon atoms, Al is aluminum, X is a halogen from the group of fluorine, chlorine, bromine and iodine, and n equals 0, 1 or 2, and
3. a compound defined by the formula:

$$NR_1R_2R_3$$

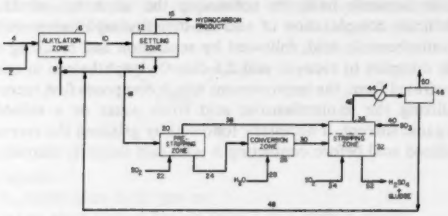
in which R_1 and R_2 are selected from the group of hydrogen, alkyl, aralkyl, aryl, alkenyl and alkaryl, R_3 is selected from the group of hydrogen, alkyl and alkenyl, said R's containing from 1 to 20 carbon atoms

to produce olefins containing a higher and lower number of carbon atoms than the original olefins, in which the molar relationship of catalyst component (3) to catalyst component (1) ranges from 0.5/1 to 3.0/1 and the molar relationship of catalyst component (2) to catalyst component (1) ranges from 0.5/1 to 5.0/1.

4,073,821
SO_2 STRIPPING IN FLUOROSULFURIC ACID CATALYST REGENERATION

Michael Siskin, Maplewood, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Feb. 28, 1977, Ser. No. 772,639
Int. Cl.[2] C07C 3/54
U.S. Cl. 260—683.47 8 Claims



1. In an alkylation process which comprises:

a. contacting an olefin with a paraffin in an alkylation zone under alkylation conditions and with a catalyst comprising fluorosulfuric acid to form a reaction mixture of fluorosulfuric acid phase and a hydrocarbon phase including alkylate product,

b. separating said hydrocarbon phase from said fluorosulfuric acid catalyst phase, said fluorosulfuric acid catalyst phase being at least partly deactivated,

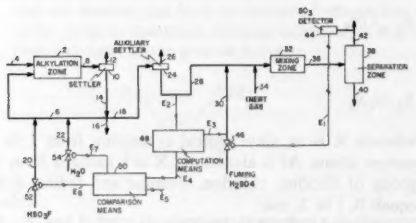
c. regenerating at least a portion of said acid catalyst phase separated in step (b); the improvement which comprises;

d. employing sulfur dioxide as the stripping agent during said regeneration, in step (c).

4,073,822
METHOD FOR CONTINUOUSLY CONTROLLING THE EQUIVALENT WATER CONTENT OF FLUOROSULFURIC ACID CATALYSTS

Ivan Mayer, Summit, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 645,270, Dec. 29, 1975, Pat. No. 4,018,846. This application Jan. 3, 1977, Ser. No. 756,479
The portion of the term of this patent subsequent to Apr. 19, 1977, has been disclaimed.
Int. Cl.[2] C07C 3/54
U.S. Cl. 260—683.47 9 Claims



1. In an alkylation process wherein a paraffin is reacted with olefins in the presence of an acid catalyst formed from at least fluorosulfuric acid and water according to the reaction

$$HSO_3F + XH_2O \rightleftarrows XHF + XH_2SO_4 + (1-X)HSO_3F$$

where X is the moles of water per mole of fluorosulfuric acid, to provide an acid catalyst-hydrocarbon mixture to a settling zone wherein a hydrocarbon product is separated from the acid catalyst, a major portion of the acid catalyst from said settling zone is being recycled to the alkylation zone, and wherein fresh fluorosulfuric acid, water or mixtures of said fluorosulfuric acid and water are added to said alkylation process, the improvement which comprises continuously controlling the equivalent water content of said acid catalyst by continuously controlling the addition rate of fresh fluorosulfuric acid, water or mixtures thereof to said alkylation process, according, to the steps:

1. withdrawing a sample of the acid catalyst from said settling zone;
2. intimately contacting said sample with a stream of fuming sulfuric acid in an amount sufficient to ensure substantially complete reaction of the HF present in said sample with the SO_3 present in said fuming sulfuric acid when $X \leqq 1$ and to ensure substantially complete reaction of the HF, water or mixtures of said HF and water present in said sample when $X > 1$;
3. sensing the presence of SO_3 evolved in step (2) after said complete reaction of the HF, water or mixtures of said HF and water present in said sample and providing a control signal in accordane with said sensed presence of SO_3;
4. controlling the rate of fuming sulfuric acid addition in step (2) in response to the control signal of step (3) such that said concentrated acid in step (2) is at the point of incipient fuming;
5. sensing the flow rate of the sample being withdrawn in step (1) and the flow rate of said fuming sulfuric acid stream being added in step (2);
6. providing a signal corresponding to the equivalent water content of the sample of step (1) in accordance with the sensed flow rate of said sample and the flow rate of said fuming sulfuric acid of step (5);
7. providing a reference signal in a computation means corresponding to a desired equivalent water content in said acid catalyst;
8. comparing the signals from step (6) and step (7) to provide a control signal;
9. controlling the addition rate of fresh fluorosulfuric acid, water or mixtures of said fluorosulfuric acid and water to said process in accordance with the control signal from step (8) and thereby controlling the equivalent water content of the acid catalyst during said alkylation.

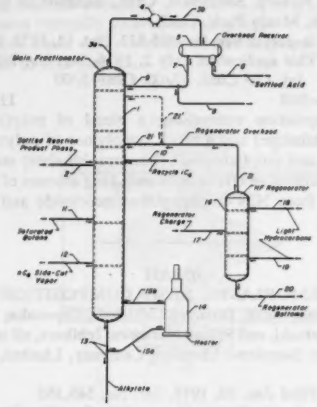
4,073,823
ALKYLATION PROCESS UTILIZING HF REGENERATOR STREAM TO A MULTI-TRAY MAIN FRACTIONATOR

Bipin V. Vora, Wheeling, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 660,900, Feb. 24, 1976, abandoned, which is a continuation-in-part of Ser. No. 533,421, Dec. 16, 1974, Pat. No. 3,956,416. This application May 2, 1977, Ser. No. 793,225
Int. Cl.[2] C07C 3/54
U.S. Cl. 260—683.48 5 Claims

1. In a process for producing an alkylation reaction product from an isoparaffin reactant and an olefinacting reactant using liquid HF catalyst wherein said reactants and said catalyst are admixed in a reactor at alkylation conditions, a reactor effluent is settled to form a settled HF phase containing acid soluble oils and a settled hydrocarbon product phase containing alkylate product and unreacted isoparaffin reactant, said product phase is fractionated in a multi-tray fractionator having an overhead vapor withdrawal locus for separation of HF phase and propane product phase, an alkylate product withdrawal locus at the bottom of said fractionator for withdrawal of alkylate product, a feed point at an intermediate locus of said fractionator for introduction of said settled hydrocarbon product phase into said fractionator, and an isoparaffin reactant recycle locus above said feed point, and wherein at least a portion of said settled HF phase is introduced to an HF regenerator and therein contacted at stripping conditions with a light hydrocarbon to strip HF from said acid soluble oils, withdrawing said acid soluble oils from a lower part of said regenerator, the improvement which comprises introducing

the regenerator overhead vapor to said fractionator at a locus at least two theoretical trays below the top of said fractionator and above said isoparaffin recycle locus and wherein the fractionation conditions in said fractionator are maintained to prevent formation of a separate liquid hydrogen fluoride phase within said fractionator.

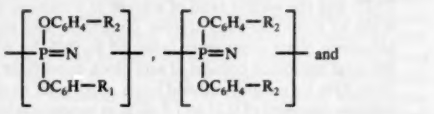


4,073,824
POLYPHOSPHAZENE BLENDS

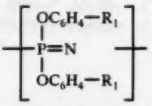
Ronald L. Dieck, and Edwin J. Quinn, both of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Division of Ser. No. 705,116, July 14, 1976. This application June 1, 1977, Ser. No. 802,307
Int. Cl.[2] C08J 9/06
U.S. Cl. 260—823 **5 Claims**

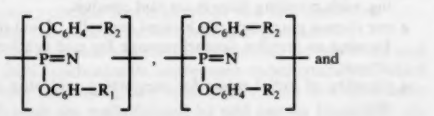
1. A composition comprising a blend of at least one relatively elastomeric polyphosphazene copolymer having a Young's Modulus of in the range of 1×10^6 to 5×10^8 dyne/cm^2 and having randomly repeating units represented by the formulas



and



wherein R_1 and R_2 are the same or different and are hydrogen, a C_1–C_{10} linear or branched alkyl radical, or a C_1–C_4 linear or branched alkoxy, with the proviso that when R_2 is alkoxy, R_1 and R_2 are different; with at least one relatively stiff or rigid polyphosphazene homopolymer or copolymer having a Young's Modulus in the range of 5×10^8 to 6×10^{10} dynes/cm^2 and having randomly repeating units represented by the formulas



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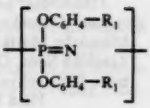


wherein R_1 and R_2 are the same or different and are hydrogen, a C_1–C_{10} linear or branched alkyl radical, or a C_1–C_4 linear or branched alkoxy, said relatively elastomeric copolymer:relatively stiff or rigid homopolymer or copolymer being present in said blend in a ratio of from about 1:3 to about 3:1.

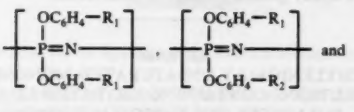
4,073,825
POLYPHOSPHAZENE POLYMER/SILICONE RUBBER BLENDS AND FOAMS THEREFROM

Ronald L. Dieck, and Edwin J. Quinn, both of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

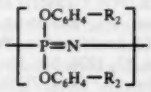
Division of Ser. No. 718,412, Aug. 30, 1976, Pat. No. 4,026,839. This application Dec. 20, 1976, Ser. No. 752,570
Int. Cl.[2] C08L 43/02
U.S. Cl. 260—824 R **8 Claims**

1. A curable polymer blend comprising:

A. a polyphosphazene comprising randomly distributed repeating units represented by the formulas:



and



wherein R_1 and R_2 are the same or different and are hydrogen, a C_1 - C_{10} linear or branched alkyl radical, or a C_1 - C_4 linear or branched alkoxy radical substituted or any sterically permissible position on the phenoxy group,

B. a poly(organosiloxane) elastomer,

C. said polymer (A) being present in an amount of about 15% to about 85% by weight and said polymer (B) being present in an amount of about 85% to about 15% by weight, based on the combination of (A) and (B).

4,073,826
TACKIFIERS FOR ELASTOMERS

Thomas M. Galkiewicz, Schenectady; Kenneth C. Petersen, Scotia, and John L. Sullivan, Ballston Lake, all of N.Y., assignors to Schenectady Chemicals, Inc., Schenectady, N.Y.

Continuation-in-part of Ser. No. 544,772, Jan. 28, 1975. This application May 5, 1975, Ser. No. 574,625
Int. Cl.[2] C08G 8/20, 16/04
U.S. Cl. 260—831 **37 Claims**

1. An admixture of a tackifier resin comprising a resin reaction product AB, wherein A is the residue of an alkyl phenol novolac resin, wherein the alkyl or said alkyl phenol novolac is a hydrocarbon radical of 4 to 16 carbon atoms; and wherein B is a residue of an oxirane bearing material, wherein B comprises 1 to 38 weight percent of AB; wherein AB is substantially a thermoplastic resin, characterized by a WPE of at least 2000, with a sulfur-curable elastomer which is a hydrocarbon, halohydrocarbon or hydrocarbon-acrylonitrile elastomer, wherein said tackifier resin comprises 0.5 to 20 parts by weight to 100 parts by weight of elastomer.

4,073,827

THERMOPLASTIC RESINOUS COMPOSITION

Hotsuma Okasaka, Nagoya; Kiyokazu Nakamura, Chiryu; Masanobu Morikawa, Nagoya; Kenji Tsunashima, Kyoto, and Atsuhiko Soda, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Feb. 6, 1976, Ser. No. 656,080
Claims priority, application Japan, Feb. 10, 1975, 50-16292
Int. Cl.[2] C08L *63/00*
U.S. Cl. 260—835 8 Claims

1. A thermoplastic resinous composition which comprises a blend of:

(a) 50 to 99% wt % of a polyester comprising a dicarboxylic acid component, wherein at least 50 mol % of said dicarboxylic acid component is terephthalic acid, and a glycol component, wherein at least 50 mol % of said glycol component is 1,4-butanediol;

(b) 50 to 1 wt % of α-olefin copolymer, wherein the weight percentages are based on the total weight of (a) and (b), said α-olefin copolymer being a copolymer of α-olefin selected from the group consisting of ethylene and propylene, in combination with at least one vinyl monomer selected from the group consisting of vinyl acetate acrylic acid, zinc acrylate, calcium acrylate, sodium acrylate, methyl acrylate, glycidyl acrylate, methacrylic acid, maleic acid, and maleic anhydride, and

(c) 0.1 to 20 parts by weight on the basis of 100 parts by weight of (a) and (b) of an epoxy compound having one or two epoxy groups attached to a molecule.

4,073,828

ETHYLENICALLY UNSATURATED MONOMER SOLUTIONS CONTAINING URYLATED LINEAR POLYESTER/POLYURETHANE RESINS

James Ferrarini, Aston, Pa., and Erich Kuehn, Wilmington, Del., assignors to ICI Americas Inc., Wilmington, Del.

Filed Apr. 12, 1976, Ser. No. 676,531
Int. Cl.[2] C08L *75/00*
U.S. Cl. 260—859 R 29 Claims

1. A solution comprising a homogeneous mixture having 5–70 percent by weight of a linear polyester urethane urea resin wherein the number of urylene and urethane groups are substantially equal and free of ethylenic unsaturation formed by urylene-linking a linear isocyanate terminated polyester free of ethylenic unsaturation having a molecular weight within the range of 500–3000 and 30–95 percent by weight of an ethylenically unsaturated monomer.

4,073,829

PHOSPHORUS FLAME RETARDANT COMPOSITIONS

Kurt Moedritzer, Webster Groves, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed June 14, 1976, Ser. No. 695,702
Int. Cl.[2] C08L *67/02*
U.S. Cl. 260—860 2 Claims

2. The combination of polyethylene terephthalate together with 1–20 wt.% of a polymeric ester having as moieties thereof, (A) an aliphatic alcoholic moiety of an alcoholic reactant of 5 to 20 carbon atoms, and from 2 to 6 hydroxyl functional groups, with the proviso hat there is no hydrogen atom on the carbon atoms beta to the hydroxyl oxygen, (B) a moiety of a phosphorus-containing acid halide, ester or amide reactant of 0 to 20 carbon atoms having from 1 to 4 functional groups, and (C) a different alcoholic moiety as defined in (A) or a different phosphorus-containing moiety defined in (B), the said ester having a degree of aggregation of 2 to 100, and with each of (A), (B) and (C) being present at from 1 mole to 99 mole %, with the proviso that the number of alcoholic functional groups on the alcoholic reactants is equal to the number of the said functional groups on the phosphorus-containing reactants.

4,073,830

POLY(TETRAMETHYLENETEREPHTHALATE) CROSSLINKED BY IRRADIATION

David Dolph Nyberg, Sunnyvale, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 405,522, Oct. 11, 1973, Pat. No. 3,968,015. This application July 2, 1976, Ser. No. 702,202
Int. Cl.[2] C08L *67/00;* C08F *8/00*
U.S. Cl. 260—860 11 Claims

1. A composition comprising a blend of poly(tetramethyleneterephthalate) and a block copolymer of polytetramethyleneether and poly(tetramethyleneterephthalate) said composition containing an effective crosslinking amount of a member selected from N,N′-m-phenylenedimaleimide and triallyl cyanurate.

4,073,831

THERMOPLASTIC RESIN COMPOSITION

Minoru Tabana, Suita; Tatsuyuki Mitsuno, Toyonaka; Hiroshi Maki, Takatsuki, and Shizuo Narisawa, Ichihara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jan. 30, 1975, Ser. No. 545,350
Claims priority, application Japan, Feb. 2, 1974, 49-13924
Int. Cl.[2] C08L *53/00*
U.S. Cl. 260—876 B 6 Claims

1. A resin composition consisting essentially of

polystyrene having a molecular weight of 150,000 to 500,000 and

a styrene-butadiene block copolymer represented by the formula $A_1—B_1—C—B_2—A_2$,

wherein A_1 and A_2 represent non-elastomeric blocks composed of polymeric styrene chains, B_1 and B_2 represent elastomeric blocks composed of random-copolymer chains containing styrene and butadiene units uniformly distributed therein, C represents an elastomeric block composed of a polymeric butadiene chain or a styrene-butadiene copolymer chain, the total amount of A_1 and A_2 is 40 to 80% by weight, the total amount of B_1 and B_2 is 10 to 60% by weight, the amount of C is 0 to 25% by weight provided that the amount of C is smaller than the total amount of B_1 and B_2, the weight ratio of A_1 to A_2 is 2:8 to 8:2, the weight ratio of B_1 to B_2 is 0:10 to 10:0, the weight ratio of styrene to butadiene in B_1 and B_2 is 10:90 to 75:25, and the weight ratio of styrene to butadiene in C is 0:100 to 10:90, the total styrene content to said styrene-butadiene block copolymer being 65 to 90% by weight, the total butadiene content of said block copolymer being 10 to 35% by weight, and said block copolymer having an intrinsic viscosity of 0.35 to 1.8 dl/g, as measure in toluene at 30° C, said resin composition obtained by mixing said polystyrene and said block copolymer.

4,073,832

GAS SCRUBBER

Rodney McGann, Northridge, Calif., assignor to Texaco Inc., New York, N.Y.

Filed June 28, 1976, Ser. No. 700,622
Int. Cl.[2] B01D *47/10*
U.S. Cl. 261—118 2 Claims

1. A carbon scrubber for removing carbon from a synthesis gas stream, comprising in combination

a ring having a ring cylindrical inner surface the diameter of which is equal to the inside diameter of a conduit for said synthesis gas stream,

said ring having an outside diameter sufficient for cooperating with coupling flanges on said conduit,

a tear shaped plug coaxially located centrally of said ring for forming an annular venturi passage for said synthesis gas stream,

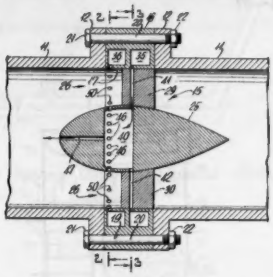
a plurality of radial struts for supporting said plug in said ring,

said struts being streamlined for minimizing flow disturbance in said gas stream,

a pair of manifolds in said ring for supplying water for scrubbing said gas stream,

a plenum centrally located in said plug,

passages inside said struts for connecting one of said manifolds to said plenum,



a first plurality of ports located peripherally on said plug and connected to said plenum for spraying water outward into the throat of said annular venturi passage,

a passage from said plenum to the nose of said plug for keeping the front surfaces wet and clean, and

a second plurality of ports located on the inside of said ring radially opposite said first ports and connected to the other of said pair of manifolds.

4,073,833

ENCAPSULATION PROCESS

Robert Gene Laughlin, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 8, 1975, Ser. No. 638,774

Int. Cl.[2] A61J *5/00;* **A61M** *31/00*

U.S. Cl. 264—4 **8 Claims**

1. In a process for releasably enclosing an aqueous solution of a micelle-forming spermicidal nonionic surfactant in a receptacle, wherein at least one portion of a wall of said receptacle ultimately comprises a microporous cellulose membrane, by initially fashioning a receptacle containing said surfactant solution comprising an acylated cellulose membrane precursor and thereafter deacylating said membrane precursor by contacting same with an aqueous solution comprising from about 3% to about 50% by weight of ammonia or water-soluble primary or secondary amine, the improvement which comprises: dissolving sufficient electrolyte selected from alkali metal chlorides and ammonium chloride in said solution of ammonia or watersoluble amine to avoid osmotic rupture of the membrane precursor or resulting membrane.

4,073,834

METHOD OF MAKING NUCLEAR FUEL ELEMENTS

Karol J. Mysels, La Jolla, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Mar. 5, 1975, Ser. No. 555,688

Int. Cl.[2] G21C *21/00*

U.S. Cl. 264—0.5 **12 Claims**

1. A method of making a nuclear fuel element, which method comprises

providing a porous graphite block having a plurality of fuel chambers formed therein and also having a plurality of open holes for the flow of coolant therethrough,

disposing nuclear fuel material in said fuel chambers,

closing the nuclear fuel-containing fuel chambers,

impregnating said nuclear-fuel-containing porous block with a liquid carbonizable impregnant under conditions which cause the impregnant to penetrate from said open holes through the walls formed by said porous block and into said closed fuel chambers so as to enter said nuclear fuel material disposed in said fuel chambers, and

heating said impregnated block to carbonize said impregnant in situ whereby said nuclear fuel material becomes integrally bound to said porous graphite block at the interior wall surfaces of said fuel chambers thus providing excellent heat transfer therebetween.

4,073,835

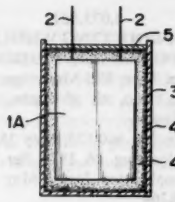
METHOD OF RESIN ENCAPSULATING ELECTRICAL PARTS WITH UV CURING OF FIRE RETARDANT RESIN

Akira Otsuki, and Makoto Nishino, both of Tokyo, Japan, assignors to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan

Filed Jan. 30, 1976, Ser. No. 653,878

Int. Cl.[2] B29C *5/00;* **B29D** *3/00;* **B29G** *3/00*

U.S. Cl. 264—22 **8 Claims**



1. A process for encapsulating an electrical element comprising the steps of:

placing an electrical element in a mold made of an ultraviolet light transmissible material;

introducing a liquid resin composition capable of being cross-linked and cured by the action of ultraviolet light and heat into the space between the mold and the electrical element enclosed therein, said composition containing a fire retardant

selected from the group consisting of aluminum hydroxide, a combination of a halide and antimony oxide, and phosphoric acid esters and is contained in the liquid resin composition in an amount by weight of 10–70 parts per 100 parts by weight of the resin composition;

irradiating said composition in the mold with ultraviolet light to crosslink and cure at least the outer portion of the liquid resin composition and make the resin removable from the mold without deformation;

removing from the mold the at least partially crosslinked and cured resin composition with the electrical element enclosed therein; and

heating said at least partially crosslinked and cured resin composition to complete the cure thereof, thus obtaining an encapsulated electrical element.

4,073,836

METHOD AND APPARATUS FOR SEALING A PIPELINE LEAK

George W. Harrison, 2119 Sieber Drive, Houston, Tex. 77017, and Billie G. Moore, 319 Meyer, Alvin, Tex. 77511

Filed Apr. 16, 1976, Ser. No. 677,864

Int. Cl.[2] B29F *1/10;* **B32B** *31/00*

U.S. Cl. 264—36 **6 Claims**

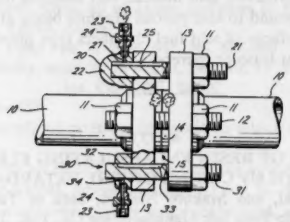
1. A method for sealing leaks at bolted flanged connections of pipelines comprising

replacing at least one of the flange bolts with a valve means opening to a gap between the flange faces,

venting the gap through the valve means,

wrapping wire over the exposed flange bolts in the gap

between the pipeline flange faces so as to form one or more layers of wire in the gap, and



injecting a sealant through the valve means to fill the interior of the gap to stop the leak.

4,073,837

PROCESS FOR PRODUCING WHOLLY AROMATIC POLYAMIDE FIBERS

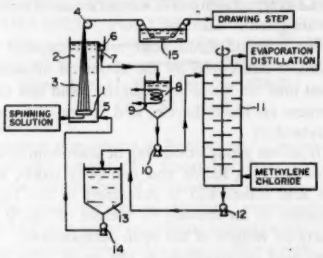
Keiji Kouzai; Yutaka Tabe; Eiji Masunaga, all of Iwakuni, and Kichiro Matsuda, Hino, all of Japan, assignors to Teitin Limited, Osaka, Japan

Continuation of Ser. No. 360,535, May 15, 1973, abandoned. This application Aug. 26, 1975, Ser. No. 607,790

Claims priority, application Japan, May 18, 1972, 47-48521; June 13, 1972, 47-58264

Int. Cl.[2] D01F *7/00*

U.S. Cl. 264—38 **6 Claims**



1. A process for producing wholly aromatic polyamide filaments having at least 75 mol% of the recurring units being derived from m-phenylene isophthalamide, said process comprising extruding a spinning solution of said wholly aromatic polyamide in an amide solvent having a polymer concentration of 15 to 30 % by weight and being free of inorganic salts through a spinneret into an aqueous coagulating bath containing a total concentration of calcium chloride, magnesium chloride, calcium nitrate and zinc chloride of at least 35% by weight of liquid and a concentration of calcium chloride of at least 20% by weight of liquid and having an amide solvent concentration of not more than 3% by weight of liquid to the vicinity of said spinneret, said amide solvent essentially consisting of N-methyl-2-pyrrolidone, taking-up the coagulated filaments from the lower portion to the upper portion of the coagulating bath, flowing the coagulating liquid in said bath at an average velocity from 0.04 to 0.1 times the velocity of filament take-up in the filament advancing direction, discharging the coagulating liquid having a specific gravity, measured at 60° C of at least 1.36 and an amide solvent concentration of not less than 4% by weight from said bath, extracting N-methyl-2-pyrrolidone from the discharged coagulating liquid with an organic solvent consisting essentially of methylene chloride, and recovering the N-methyl-2-pyrrolidene from the organic solvent.

4,073,838

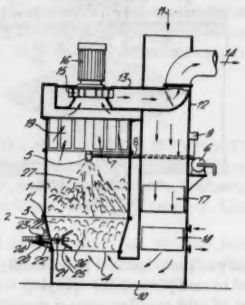
GRANULATING PROCESS

Heinrich Barnickel; Winfrid Sigl, and Jorg Schwable, all of Biberach an der Riss, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Continuation-in-part of Ser. No. 496,864, Aug. 12, 1974, abandoned. This application May 19, 1976, Ser. No. 688,104

Int. Cl.[2] B01J *2/16*

U.S. Cl. 264—37 **4 Claims**



1. A batch process for forming a product granulate having a predetermined granule size distribution from a powdered starting material selected from the group consisting of a single powdered solid substance or a mixture of powdered solid substances, the particles of the granulated product being larger than the particles of the powdered starting material, which comprises the steps of

(a) blowing air at an elevated temperature upwardly through a batch of said powdered starting material to form a fluidized bed having a lower portion and an upper portion,

(b) spraying into the upper portion of said fluidized bed a bonding agent solution at a rate sufficient to cause particles of powdered starting material in the upper portion of the fluidized bed to coalesce and build-up granules, whereupon large granules migrate from the upper portion to the lower portion of the fluidized bed,

(c) breaking up large granules in the lower portion of the fluidized bed into smaller granules by impact with rigid blades moving at high speed such that the build-up of granules in the upper portion of the fluidized bed slightly exceeds the break-up of granules and until the desired granule size distribution is achieved,

(d) stopping the bonding agent spray, the blade motion and the air blowing, and

(e) recovering the product granulate.

4,073,839

METHOD OF ZONE POURING FOAM PRODUCTS

Theodore B. Burkholder, Perrysburg; Robert J. Stalter, Bowling Green, and Paul N. Skotynsky, Oregon, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

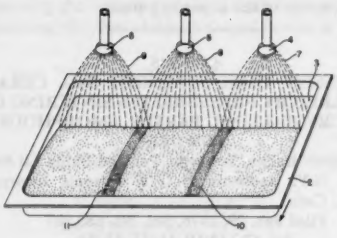
Filed Apr. 19, 1976, Ser. No. 677,943

Int. Cl.[2] B29D *27/04*

U.S. Cl. 264—45.1 **4 Claims**

1. A method of forming a foamed article having zoned of varying hardness comprising moving a shaping means relative to a bank of at least two foam pouring means which are aligned in a direction transverse to the direction of relative movement of said shaping means, causing each of said pouring means to distribute a foamable mixture over the surface of the shaper in a fan-like planular pattern transverse to the direction of said shaping means in response to the relative motion between the pouring means and the shaper, adjusting the fan-like planular pattern between the adjacent pouring means to control the area of overlap of said patterns to define zones in the foamed article

of different physical characteristics and adjusting the nature of the foamable mixture exiting each pouring means whereby a



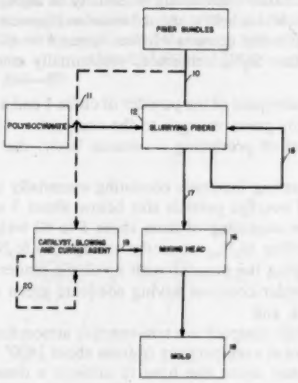
foamed article having different physical characteristic is formed.

4,073,840

METHOD FOR FORMING A FIBER REINFORCED FOAM ARTICLE

Glen E. W. Saidla, Hampton Falls, N.H., assignor to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 407,829, Oct. 19, 1973, abandoned. This application Apr. 7, 1975, Ser. No. 565,949
Int. Cl.[2] B29D *27/04*
U.S. Cl. 264—45.3 8 Claims



1. A method of forming a foam article having a predetermined distribution of randomly oriented fiber filaments of staple length throughout the article and a substantially uniform weight ratio of fiber filaments to foam resin throughout comprising:

a. adding fibers of staple length to at least one major component of a foamable resin composition thereby forming a fiber slurry;

b. pumping said slurry through a circulating line for a time sufficient to separate the fibers into discrete fiber filaments and to wet said fiber filaments with said major component while maintaining the structural integrity of said fiber filament thereby forming a substantially uniform dispersion of randomly oriented fibers in said component;

c. mixing said dispersion with the balance of components necessary to form a foamable resin composition;

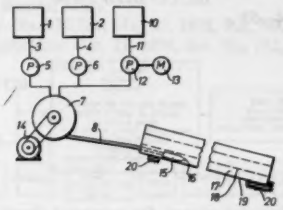
d. thereafter allowing the resin composition to foam in an appropriate mold whereby a foam article is provided having a substantially uniform weight ratio of fiber filaments to foam resin throughout.

4,073,841

PROCESS FOR UNIFORMLY FILLING CAVITIES WITH A FOAM INSULATING MATERIAL

Gerd Dülltgen, Dabringhausen, and Wolfgang Schmidt, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 2, 1975, Ser. No. 619,090
Int. Cl.[2] B29D *27/04*
U.S. Cl. 264—46.6 3 Claims



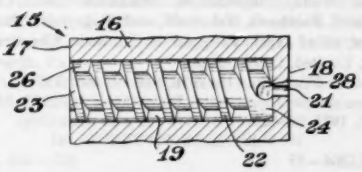
1. A process for filling a cavity with insulating material, comprising introducing a liquid, foamable reaction mixture into the cavity through the outlet nozzle of a mixing head while simultaneously drawing the mixing head through the cavity and accelerating the reactivity of the reaction mixture from the beginning of the filling procedure to its end by increasing the amount of catalyst to the foamable reaction mixture.

4,073,842

METHOD FOR PREPARING FOAM PLASTIC LOOSE FILL PACKING

Layle V. Smith, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 182,137, Sept. 20, 1971, abandoned, which is a continuation-in-part of Ser. No. 831,572, June 9, 1969, abandoned. This application June 11, 1973, Ser. No. 368,793
Int. Cl.[2] B29D *27/00*; B29B *1/03*
U.S. Cl. 264—53 6 Claims



1. In a method for the preparation of synthetic resinous dunnage material, the method comprising

providing a heat plastified expandable extrudable synthetic resinous composition,

extruding the synthetic resinous composition to form at least one strand,

severing the strand to provide a plurality of strand segments which can form a plurality of expanded or foamed strand segments, the improvement which comprises

extruding the thermoplastic composition through a die having a generally helical die extrusion passageway immediately prior to the discharge end of the die, passing the thermoplastic composition through the helical die extrusion passageway, thereby imparting helical molecular orientation to the material within the die passageway and to the strand being extruded, the molecular orientation imparts a generally helical configuration to the strand segments when foamed.

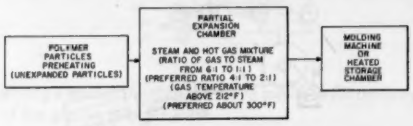
4,073,843
PROCESS OF PARTIALLY EXPANDING THERMOPLASTIC PARTICLES USING A MIXTURE OF STEAM AND A HOT DRY GAS

Stuart Bruce Smith, Chelmsford, Mass., assignor to Foster Grant Co., Inc., Leominster, Mass.

Continuation-in-part of Ser. No. 288,230, Sept. 11, 1972, abandoned, and Ser. No. 359,578, May 11, 1973, abandoned. This application Jan. 15, 1975, Ser. No. 541,302

Int. Cl.[2] B29D *27/00*

U.S. Cl. 264—53 **6 Claims**


POLYMER PARTICLES PREHEATING (UNEXPANDED PARTICLES)
PARTIAL EXPANSION CHAMBER
STEAM AND HOT GAS MIXTURE (RATIO OF GAS TO STEAM FROM 6:1 TO 1:1 (PREFERRED RATIO 4:1 TO 2:1) (GAS TEMPERATURE ABOVE 212°F) (PREFERRED ABOUT 300°F)
MOLDING MACHINE OR HEATED STORAGE CHAMBER

1. An improved process for preparing thermoplastic polymer particles for molding by partial expansion thereof, said thermoplastic particles containing a normally liquid blowing agent, comprising:

charging an amount of said particles into a chamber;

heating said particles while agitating them in said chamber to a temperature above the atmospheric boiling point of the blowing agent and the softening temperature of the particles with a gaseous heating medium comprised of a mixture of steam and another dry hot gas, the ratio of the other dry hot gas to steam in the mixture being in the range of about 6:1 to about 1:1 and wherein the other dry hot gas of the mixture when added thereto is at a temperature above 212° F., but below the temperature at which said polymer particles liquify and flow, a substantial portion of the steam penetrating the particles to heat the inner portions thereof and a substantial portion of the other dry hot gas serving to heat the outside of the particles to keep them dry by immediately evaporating any condensation from the steam on the outside of the particles.

4,073,844
PREPARATION OF CROSSLINKED POLYOLEFIN FOAMS AND THE MOLD

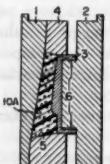
Motomu Wada, Nagaokakyo; Masakazu Inoue, Ibaragi; Kazunori Furukawa, Takatsuki, and Shigeyoshi Matsubara, Settsu, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 15, 1976, Ser. No. 667,137

Claims priority, application Japan, Mar. 22, 1975, 50-34820; Apr. 15, 1975, 50-46246

Int. Cl.[2] B29D *27/00*

U.S. Cl. 264—55 **1 Claim**



1. In a method for the preparation of crosslinked polyolefin foams comprising charging a heated expandable sectioned mold with crosslinkable polyolefin foamable components, said components being in the form of a melt while decomposition of the crosslinking and foaming agents occurs, increasing the size of the mold cavity and simultaneously cooling the mold, while permitting said components to foam the improvement comprising rapidly moving a predetermined distance to permit subsequent enlargement of the mold cavity one section of the mold to which is slidably mounted a sliding piece which is not moved and remains in contact with said charged components and permitting said sliding piece to move said predetermined distance by means of the expanding foam.

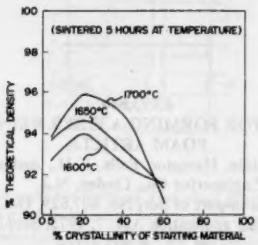
4,073,845
HIGH DENSITY HIGH STRENGTH Si_3N_4 CERAMICS PREPARED BY PRESSURELESS SINTERING OF PARTLY CRYSTALLINE, PARTLY AMORPHOUS Si_3N_4 POWDER

Sergej Tomislav Buljan, Towanda, Pa., and Philip Eli Stermer, Waverly, N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 29, 1976, Ser. No. 653,507

Int. Cl.[2] C04B *33/32, 35/58*

U.S. Cl. 264—65 **15 Claims**



1. A powder mixture consisting essentially of Si_3N_4 powder of average particle size below about 3 microns characterized in that the Si_3N_4 powder consists of from about 5 to 60 weight percent crystalline Si_3N_4, remainder substantially amorphous Si_3N_4.

6. A powder compact of the powder of claim 1 and a volatile binder to provide green strength to the compact.

11. A method of producing a ceramic body, the method comprising:

(a) mixing starting materials consisting essentially of Si_3N_4 powder of average particle size below about 3 microns, the powder consisting of from about 5 to 60 weight percent crystalline Si_3N_4, remainder amorphous Si_3N_4,

(b) consolidating the powder with a volatile binder to produce a powder compact having adequate green strength and density, and

(c) sintering the compact in a non-reactive atmosphere without pressure at a temperature of from about 1400° to 1700° C for at least about one hour to achieve a dense Si_3N_4 ceramic body having a density of at least 90 and up to 96 percent of theoretical density and a room temperature modulus of rupture value approaching 100,000 psi.

4,073,846
REDUCTION-REOXIDATION TYPE SEMICONDUCTING CERAMIC CAPACITOR

Hitoshi Masumura; Shinobu Fujiwara, and Hitoshi Tanaka, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Division of Ser. No. 497,333, Aug. 14, 1974, Pat. No. 3,995,300. This application Feb. 3, 1976, Ser. No. 654,979

Int. Cl.[2] C04B *35/46*

U.S. Cl. 264—65 **1 Claim**

1. A method for producing semiconducting ceramic bodies which comprises:

(a) mixing strontium titanate, calcium titanate, bismuth oxide and titanium oxide so as to give the composition falling within the tetragonal area described by the line A-B-C-D in FIG. 6, and further adding at least one member selected from the group consisting of manganese, cobalt, nickel,

chromium, vanadium, niobium, tantalum, lanthanum and cerium ions in total amounts of 0.025 to 0.4% by weight to the resulting mixture;

(b) pressing the compositions into desired shape;

(c) sintering the thus obtained shaped bodies at a temperature of about 1350° C in an oxidizing atmosphere for about 2 hours;

(d) firing the composition of at (C) a temperature of about 850° C in a reducing atmosphere for about an hour, and;

(e) further firing the composition at a temperature of about 780° C in an oxidizing atmosphere for about an hour.

4,073,847

MULTI-STAGE BLOW HOLDING METHOD

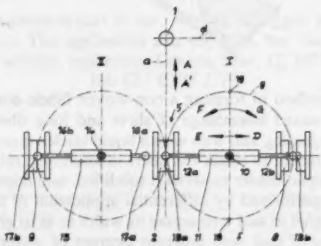
Gottfried Mehnert, Messelstrasse 25, D-1000, Berlin 33, Germany

Continuation of Ser. No. 415,802, Nov. 14, 1973, abandoned. This application Sept. 22, 1975, Ser. No. 615,796

Claims priority, application Germany, Nov. 18, 1972, 2256684

Int. Cl.² B29C *17/07*

U.S. Cl. 264—89 **5 Claims**



1. A method of converting plasticized parisons consisting of synthetic thermoplastic material into hollow shaped articles in respective open-and-shut final molds which are each located at respective final blowing stations and which each cooperate with at least two blowing mandrels, comprising the steps of inserting blowing mandrels of the respective final blowing stations into successive parisons and pneumatically expanding the latter into hollow preforms at a pre-blowing station which is located centrally of said final blowing stations; transferring successively produced preforms alternately to the respective final blowing stations by moving the respective blowing mandrels together with the preforms along circular paths each of which passes through the respective final mold when the same is in open condition, and concomitantly moving the other blowing mandrel of the same final blowing station from the final mold thereof to the vicinity of said pre-blowing station; closing the respective final mold about a preform located at the respective final blowing station; and converting the preforms at said final blowing stations into hollow shaped articles, the length of the intervals for conversion of parisons into preforms being equal to or approximating m/n wherein n is the number of final blowing stations and m is the length of the time interval for conversion of a preform into a shaped article.

4,073,848

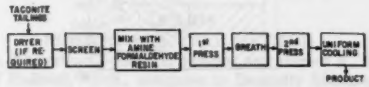
SYNTHETIC SLATE

Melvin C. Kuehn, Grand Rapids, Minn., assignor to Ormite, Inc., Grand Rapids, Minn.

Division of Ser. No. 576,750, May 12, 1975, Pat. No. 4,038,242. This application Dec. 21, 1976, Ser. No. 752,921

Int. Cl.² B29G *1/01*

U.S. Cl. 264—120 **10 Claims**



1. A method of producing a solid dense synthetic slate-like material comprising:

(a) mixing at least 5 parts by weight of a finely divided taconite iron ore material which contains at least about 1 percent magnetite therein with about 1 part by weight of an amine-formaldehyde resin precondensate to form a substantially uniform mixture;

(b) casting the mixture into a vessel;

(c) preheating under pressure said mixture to a temperature from about 200° F. to 300° F. for a period of time to cause formation of gaseous products;

(d) removing said gaseous products;

(e) heating the mixture to a temperature of from about 275° F. to 400° F. under pressure to cause solidification of the mixture; and

(f) cooling the formed solid product.

4,073,849

PROCESS FOR FORMING ELASTOMER FILMS

Norman G. Bartrug, Allison Park, and Donald L. McDaniel, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 587,471, June 16, 1975, which is a continuation of Ser. No. 475,705, June 3, 1974, abandoned. This application Jan. 29, 1976, Ser. No. 653,323

Int. Cl.² B29H *8/00*; B32B *25/04*

U.S. Cl. 264—236 **2 Claims**

1. A method of forming a continuous film from an aqueous admixture comprising an elastomeric latex and a phenolic resin, comprising:

spraying an amount of said admixture onto a surface to form a coat thereon, said surface being maintained at a temperature greater than 120° F., the amount of sid admixture sprayed thereon being sufficient to form a base film coat of less than about 0.7 mil thickness, and the adhesion between said surface and said film being less than the cohesion within said film, and

spraying a plurality of additional coats of said admixture over said base film, each of said additional coats being regulated in the amount sprayed to impart a coat thickness of each coat of less than about 0.7 mil to thereby form a continuous, uniform final film having a thickness greater than 4 mils,

removing said final film from said substrate,

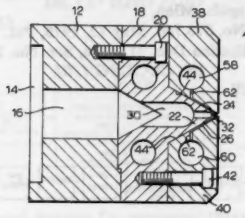
drying said film to remove substantially all water therefrom and then subjecting said final film to heat at sufficient pressure to cure said film.

4,073,850

METHOD OF PRODUCING POLYMERIC MATERIAL

Warren A. Brackmann, Cooksville, and Daniel DiIanni, Toronto, both of Canada, assignors to Rothmans of Pall Mall Canada Limited, Toronto, Canada

Filed Dec. 9, 1974, Ser. No. 530,708
Int. Cl.[2] B29C *17/06*
U.S. Cl. 264—93 4 Claims



1. A method of extruding molten polymeric material in fiber form which comprises:

converging two individual streams of air of narrow width to a merging zone for formation of a single combined air stream flowing away from said merging zone,

conveying molten polymeric material along a flow path towards said merging zone in straight line alignment with the flow path of the single combined air stream,

said flow path of said molten polymeric material and the paths of said converging individual air streams lying in a first plane,

extruding molten polymeric material from said conveyed molten polymeric material separately and simultaneously into each of said converging air streams over a predetermined path length of said air streams immediately upstream of said merging zone while preventing the extrusion of said conveyed molten polymeric material other than into said converging air streams over said predetermined path length,

drawing a single fiber from said extruded polymeric material, and

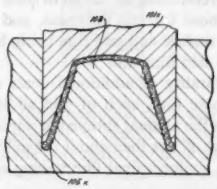
conveying said fiber away from said merging zone in said single air stream.

4,073,851

METHOD OF MAKING MOLDED BODIES FROM LIGNO-CELLULOSE PARTICLES

Edmund E. Munk, Oberstenfeld, Germany, assignor to Werzalit Pressholzwerk J.F. Werz K.G., Oberstenfeld near Stuttgart, Germany

Continuation of Ser. No. 101,028, Dec. 23, 1970, abandoned. This application Mar. 15, 1973, Ser. No. 341,607
Claims priority, application Germany, July 15, 1970, 2035053
Int. Cl.[2] B29J *5/06*
U.S. Cl. 264—109 5 Claims



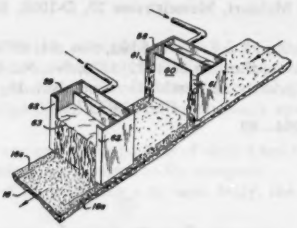
1. A method of making a molded body from ligno-cellulose particles in a cavity, comprising the steps of providing a first die section and a second die section having a cavity which is formed with an open side, a surface opposite said open side, and an exposed face extending at a steep angle to said surface from the periphery of the latter to said open side; pouring a tacky but pourable mixture of ligno-cellulose particles and an adhesive binder material into said cavity to a depth which is greater in the region of said periphery and lesser in the region inwardly spaced from said periphery; inserting said first die section into said open side and effecting relative movement of said die sections in a sense advancing said first die section along said exposed face and towards said surface; and retarding the pourable mixture in a space between said first die section and said exposed surface against displacement in direction towards said surface so that due to such retardation the mixture will be subjected to uniform pressure everywhere in said space.

4,073,852

METHOD OF MANUFACTURE FOR A FABRIC USEFUL IN A DISPOSABLE DIAPER

Frederick K. Mesek, Tinley Park, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Continuation-in-part of Ser. No. 475,081, May 31, 1974, abandoned, which is a division of Ser. No. 345,348, March 26, 1973, Pat. No. 3,837,343, which is a continuation-in-part of Ser. No. 187,249, Oct. 7, 1971, Pat. No. 3,730,184. This application May 13, 1976, Ser. No. 685,961
Int. Cl.[2] D04H *1/58*
U.S. Cl. 264—122 8 Claims



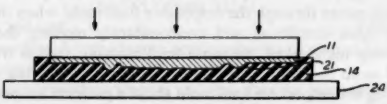
1. The method of forming a non-woven fabric comprising: forming a mixed assemblage of short and long fibers into a web; impregnating said web with a liquid binder material in an amount sufficient to retain the fibers in assembled relationship when the liquid binder material is solidified, said impregnating step being performed by differential application of the liquid binder material to said web across its width so as to give different sections of said web different degrees of wettability for water, and thereafter solidifying said binder material to thereby form said non-woven fabric.

4,073,853

METHOD OF FORMING A DESIGN AND AN ACCESSORY ARTICLE

Robert E. Chestnov, Wayne, N.J., assignor to Jaclyn, Inc., West New York, N.J.

Filed Dec. 31, 1975, Ser. No. 645,798
Int. Cl.[2] B29C *3/00*
U.S. Cl. 264—132 6 Claims



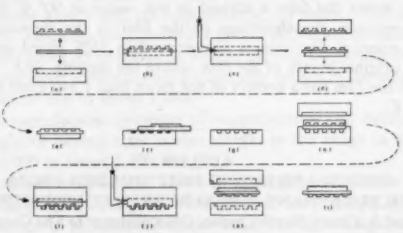
1. A method of forming a three-dimensional colored design in a piece of production material, comprising:

a. preparing a master, including forming a three-dimensional design on a piece of master material;
b. forming a mold having a cavity having a three-dimensional design portion therein from the prepared master, including positioning an enclosure having a cavity therein over the master such that the three-dimensional design on the master faces into the cavity in the enclosure, so as to form a chamber therebetween, filling the chamber with liquified mold-forming material, and hardening the liquified mold-forming material;
c. applying a two-dimensional colored design, in a two-dimensional pattern corresponding to the pattern of the three-dimensional design, to a portion of the piece of production material at a location thereon corresponding to the location of the three-dimensional design cavity portion of the mold;
d. forming a piece of light-transmitting material in the shape of the two-dimensional pattern of the three-dimensional colored design;
e. positioning the piece of production material and piece of light-transmitting material in the cavity of the mold so that the piece of light-transmitting material is disposed intermediate the two-dimensional colored design portion of the piece of production material and the three-dimensional design cavity portion of the mold; and
f. heating and pressing together the piece of production material, the piece of light-transmitting material, and the mold in a high frequency heating press so that the production material flows to conform to the three-dimensional design cavities in the mold with the piece of light-transmitting material substantially covering the three-dimensional colored design portion of the piece of production material, and hardening the piece of production material and piece of light-transmitting material.

4,073,854
METHOD OF MULTI-MATERIAL INJECTION MOULDING

Arthur Burry, 290 Adelaide Street West, Toronto, Ontario, Canada

Continuation-in-part of Ser. No. 456,752, April 1, 1974, abandoned. This application Jan. 19, 1976, Ser. No. 650,373
Claims priority, application Canada, Mar. 12, 1974, 194754
Int. Cl.[2] B29F *1/12*
U.S. Cl. 264—161 **7 Claims**

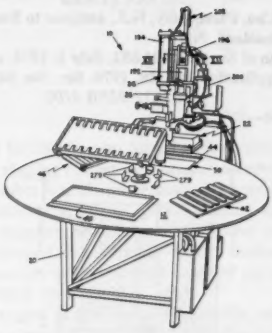


1. A method of moulding at least in part a three material, multi-material article in a plurality of stages which comprises:
a. assembling a first mould including a transfer plate and a first mould cavity at a first moulding station, said transfer plate having a surface defining a part of said first mould and having at least three channels spaced from each other and extending therethrough, at least one of said channels being in communication with said first mould cavity;
b. injecting a first mouldable material through said communicating channel in said transfer plate to create a first moulded stage in the first mould cavity, aid stage being held in fixed and oriented relationship to said transfer plate by integral connection with the moulded material in said channel;
c. removing said first moulded stage and transfer plate from the first mould cavity and transferring it into registration with a second mould cavity having a different configuration at a second moulding station to assemble a second mould, said transfer plate defining a part of said second mould and wherein a second channel in said transfer plate communicates with the second mould cavity;
d. injecting further mouldable material through said second channel in the transfer plate into the second mould cavity whereby a second state is formed and held in fixed and oriented relationship to said transfer plate;
e. moulding at least one or more additional stages in succession by repeating steps (c) and (d) for each stage to form at least in part a three material, multi-material moulded article; and
f. when the article is completed, severing the transfer plate from the completed multi-material moulded article.

4,073,855
MIRROR ASSEMBLY METHOD

Marc A. Kamerling; Jeffrey L. Franks, and Harold R. Wilson, all of Holland, Mich., assignors to Donnelly Mirrors, Inc., Holland, Mich.

Filed Mar. 5, 1974, Ser. No. 448,275
Int. Cl.[2] B29C *27/30*; B29D *3/00*
U.S. Cl. 264—249 **16 Claims**



1. A method for forming mirror assemblies comprising the steps of:
(1) grasping and holding a thermoplastic mirror case having side edges extending from a back portion in an inverted manner such that said side edges extend downwardly;
(2) immersing a portion of said case including a predetermined length of said extending side edges in a heated bath maintained at a predetermined elevated temperature for a predetermined period of time;
(3) immediately pressing said heated portions of said case into contact with a forming die having a reflective mirror element previously positioned thereon, said forming die having a forming groove, said mirror element prior to and during contact between said heated case portions and the forming die being positioned on said forming die and held in a predetermined position with respect to said forming groove by engaging positioning means with at least a portion of the mirror element which aligns the periphery of the mirror element with the forming groove prior to said pressing of the heated case portions into engagement with said forming die, and thereafter holding the mirror element on said forming die and aligned with the forming groove with holding means separate from said case and said positioning means such that the periphery of said mirror element and a portion of said mirror element spaced inboard from the periphery is left free and extending over said forming groove, and forming said heated portions into a lip extending around the edge of said mirror element with the lip contacting the surface of said mirror element which will be exposed in the finished mirror assembly at a position spaced inboard of the pe-

ripheral edge of said mirror element while holding said mirror element with said holding means, said lip being formed by forcing and urging said heated case portions around the peripheral edge of said mirror element and along and in contact with the surface of the forming groove in said forming die and under said peripheral edge and into contact with said mirror element at said inboard position whereby said lip covers the edge of said mirror element and retains said mirror element against support portions within said case; and

(4) cooling said formed portions of said case while maintaining said formed portions in their formed configuration and in contact with said mirror element.

4,073,856

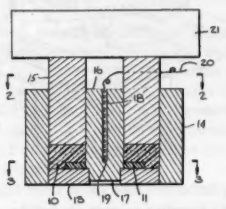
METHOD OF FABRICATING WELDED PFA-TO-PTFE STRUCTURES

Edward J. Chu, Parsippany, N.J., assignor to Resistoflex Corporation, Roseland, N.J.

Continuation of Ser. No. 484,852, July 1, 1974, abandoned. This application Jan. 16, 1976, Ser. No. 649,831

Int. Cl.[2] B29B *3/00*

U.S. Cl. 264—259 **16 Claims**



1. A method of forming a fluorocarbon resin structure in which a body of PFA resin is fused to a body of sintered PTFE resin which comprises the steps of confining a quantity of particulate PGA resin in a zone contiguous to said body of sintered PTFE resin, heating said quantity of PFA resin and at least the PTFE resin which is adjacent said zone to a temperature above the gel point of said PTFE resin and above the melting point of said PFA resin to melt said PFA resin, maintaining said elevated temperature while compacting said PFA resin against said PTFE resin under positive pressure just sufficient to urge said PFA resin melt at a very slow rate without fault producing flow therein into intimate surface contact with said PTFE resin until said former wets the surface of said latter over an area to be fused, after establishing said intimate contact, maintaining the conditions static at the fusing interface by increasing the pressure applied to said PFA resin to a predetermined level at a rate which is sufficiently slow so that there is a minimum tendency for said PFA resin to flow along the surface of said mating PTFE resin, and permitting said resins to cool slowly without force cooling toward ambient temperature while maintaining said pressure near said predetermined level where said predetermined level is chosen sufficient to prevent the formation of sinks and voids in said PFA resin while cooling but below the level at which noticeable flow is induced in said PFA resin, and continuing said cooling at least until said PFA has solidified, thereafter completing said cooling and removing said pressure, whereby said PFA resin becomes fused to said body of PTFE resin at the interface therebetween.

4,073,857

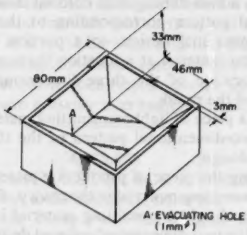
DEEP-DRAWING OF A MONOAXIALLY ORIENTED, HEAT RELAXED POLYESTER FILM

Tamio Arakawa, Hino, Japan, assignor to Teijin Limited, Osaka, Japan

Continuation-in-part of Ser. No. 504,747, Sept. 10, 1974, abandoned. This application Sept. 16, 1975, Ser. No. 613,741

Int. Cl.[2] B29C *17/03;* **C08G** *63/12*

U.S. Cl. 264—291 **2 Claims**



1. A process for producing a polyester shaped article comprising heating a polyester film to a temperature above its glass transition point but below 170° C and deep-drawing the preheated polyester film using a mold heated at a temperature at least 10° C higher than the temperature of the heated polyester film but below 200° C, wherein the starting polyester film is a monoaxially oriented, post-heat treated polyester film which contains at least 85 mol% of ethylene terephthalate units and has the following properties (i) to (iv):

i. the through-view pattern of wide angle X-ray diffraction of the film is diffuse halo,

ii. when the film is heated, while maintained at a fixed width and length, from room temperature to 160° C at a rate of 10° C/minute, and then at 160° for 30 minutes, the azimuthal scan of (100) diffraction in the through-view pattern of the film shows four peaks, and when measured with the monoaxially oriented direction of the film being caused to correspond with the meridian direction of the pattern, two pairs of the above peaks confronting each other across the equator, connected by straight lines passing through the center of the pattern, form a central angle (θ) of at least 35° but less than 180° including the equator line,

iii. when the film is dipped in hot water at 90° C for 10 seconds, the shrinkage of the film in the monoaxially oriented direction is not more than 25% based on the original length of the film before the dipping, and

iv. the film has a density of not more than 1.340 g/ml at 25° C.

4,073,858

SHOCK ABSORBING UNIT MOLDED FROM POLYURETHANE (UREA) RUBBER COMPOSITION

Daniel A. Chung, North Canton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 565,998, April 7, 1975, abandoned. This application Aug. 2, 1976, Ser. No. 710,497

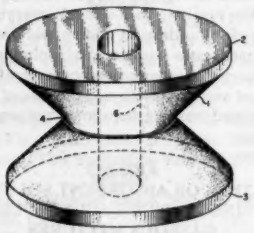
Int. Cl.[2] B32B *31/06;* **C08G** *18/32, 18/42;* **F16F** *3/08*

U.S. Cl. 264—262 **11 Claims**

1. A shock absorbing element, suitable for use in a railroad draft gear, which comprises a shaped resilient polyureaurethane composition, characterized by (A) withstanding compressive cycling for at least about 500 cycles under constant compression alternating between a maximum of about 45 to about 55 percent and a minimum of about 8 to about 12 percent of its original uncompressed height, (B) requiring at least about 4,200 pounds per square inch to compress said unit 55 percent of its original uncompressed height after 500 cycles of said compressive cycling, and (C) deflecting from about 0.3 to about 0.6 inch at about 25° C. upon the application of about

1800 pounds per square inch uniformly to the end surface areas of the said resilient compositions in its uncompressed state when the said composition is a generally disc-shaped cylindrical element with circular parallel end surfaces, said surfaces covered and adhered to circular steel plates, having a diameter of about 6.5 inches, a height of about 1.5 inches and a sidewall connecting the end surfaces substantially in the form of a V-shaped groove having substantially equal length sides, the said groove extending between the said end surfaces, the volume of the solid portion of said element being from 140 to about 160 percent of the volume of the said groove, where said resilient shock absorbing polyureaurethane composition is prepared by the method which comprises reacting a mixture of 100 parts by weight of a complex, dispersed in about 50 to about 150 parts by weight dioctyl phthalate, of 4,4'-methylene dianiline and a salt selected from sodium chloride, sodium bromide, sodium iodide, sodium nitrate, lithium chloride, lithium bromide, lithium iodide, lithium nitrite and sodium cyanide, where the mole ratio of said dianiline to said salt is about 3/1, with the reaction product of (A) a diisocyanate selected from toluene diisocyanate, 1,5-naphthalene diisocyanate, 3,3'-bitolylene-4,4'-diisocyanate, diphenylmethane-4,4'-diisocyanate, and 3,3'-dimethyldiphenylmethane-4,4'-diisocyanate and (B) a mixture of at least one polymeric polyol having a total average molecular weight in the range of about 1,150 to about 1,500, selected from:

1. a mixture of (a) about 55 to about 70 weight percent of at least one polymeric polyol having an average molecular



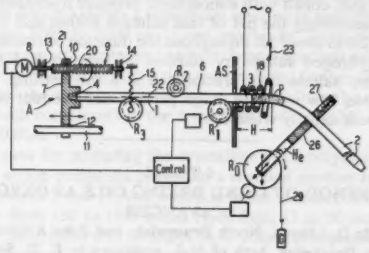
weight of about 1,800 to about 2,200 comprised of (i) about 25 to about 40 weight percent polytetramethylene ether glycol and, correspondingly, (ii) about 75 to about 60 weight percent polyester polyol and, correspondingly, (b) about 45 to about 30 weight percent polytetramethylene ether glycol having a molecular weight in the range of about 800 to about 1,200,
2. a caprolactone polyester of ϵ-caprolactone and diethylene glycol having a molecular weight in the range of about 1,000 to about 1,400, or
3. a mixture of about 55 to about 70 weight percent of at least on polycl having an average molecular weight in the range of about 1,800 to about 2,200 which comprises (a) about 25 to about 40 weight percent polyester polyol and (b) about 75 to about 60 weight percent polytetramethylene ether glycol and, correspondingly, about 45 to about 30 weight percent of at least one polyol selected from polyester and polytetramethylene ether glycol having a molecular weight in the range of about 800 to about 1,200; wherein said polyester polyol is selected from at least one of (i) caprolactone polyester of ϵ-caprolactone and diethylene glycol and (ii) polytetramethylene azelate, where the ratio of isocyanato groups to the sum of hydroxyl groups of the polyols is in the range of about 1.9 to about 2.2, where the ratio of primary amino groups of the diamine to excess isocyanato groups over the sum of said hydroxyl groups is about 0.85 to about 0.98 and where the acid number of the polyols is less than about 1.

4,073,859

TECHNIQUE FOR MAKING SILICON U-SHAPED MEMBERS

Werner Baumgartner, Munich, and Manfred Schnoeller, Haimhausen, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Dec. 4, 1975, Ser. No. 637,520
Claims priority, application Germany, Feb. 10, 1975, 2505540
Int. Cl.[2] B29C *17/02*
U.S. Cl. 264—322 **9 Claims**



1. A method for bending an initially substantially straight, uniform silicon starting rod into a U-shaped member such that the product member is uniformly electrically heatable thereafter having an axis and a pair of spaced, parallel leg members interconnected together across a pair of adjacent end portions thereof by an integral, hemicircular curved section having a substantially constant predetermined angle of curvature, said method comprising the steps of

A. exposing a region in horizontally extending such starting silicon rod to a heating zone which warms said region to its softening temperature, said region having an axial length of from about ½ to 5 times the average transverse thickness of said rod, said softened region being located generally adjacent one edge of the predetermined mid-section of said rod, said rod being simultaneously supported on each side of said softened region, then

B. simultaneously

1. pushing said rod from a portion of the leg thereof which is remote to that leg thereof which is adjacent said softened region through said heating zone at a constant rate whereby said softened region progresses along said mid section with concurrent cooling to point of rigidity occurring on either longitudinal side of said softened region,
2. bending downwardly said rod at a portion of said adjacent leg thereof, the bending occurring in said softened region and the bending being at a predetermined constant angle,
3. pulling said rod from a portion of said adjacent leg thereof from said heating zone, the rate of said pulling being substantially equal to the rate of said pushing,

said pushing, said bending, and said pulling, being conducted

a. with the axis of said rod being maintained in a substantially planar configuration,
b. until said mid section is formed into a hemicircular configuration having a substantially constant predetermined angle of curvature, and
c. while maintaining said rod at a substantially constant length, and then

C. simultaneously removing said heating zone from said rod, ceasing said pushing, said bending and said pulling, and supporting said rod until said softened region solidifies.

4,073,860

PRECIPITATION OF FILTERABLE NICKEL AND/OR COBALT SULFIDES FROM ACID SOLUTIONS

David A. Huggins, Sudbury, and Norman C. Nissen, Toronto, both of Canada, assignors to The International Nickel Company, Inc., New York, N.Y.

Filed July 23, 1973, Ser. No. 381,861
Claims priority, application Canada, Sept. 11, 1972, 151413
Int. Cl.[2] C01G *51/00, 53/00*
U.S. Cl. 423—140 9 Claims

1. A process for the precipitation of sulfides of the group consisting of nickel and cobalt sulfides and mixtures thereof comprising contacting at a temperature of about 50° C. to about 100° C. an aqueous solution having a pH of about 2.0 to about 3.0 and containing ion of metal of the group consisting of nickel and, cobalt with atmospheric pressure hydrogen sulfide and maintaining the pH of said solution within said range of about 2.0 to about 3.0 throughout the duration of reaction with said hydrogen sulfide by addition of base to said solution whereby hydrogen sulfide thus precipitated is a fast settling, readily filterable, low moisture, large particle size product having a high-bulk density when dry.

4,073,861

METHOD OF USING DRYING OILS AS OXYGEN SCAVENGER

Rudolfo D. Cilento, North Brunswick, and John Anthony Hill, New Brunswick, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 31, 1975, Ser. No. 627,565
Int. Cl.[2] C01B *13/00;* C09K *3/00*
U.S. Cl. 423—219 6 Claims

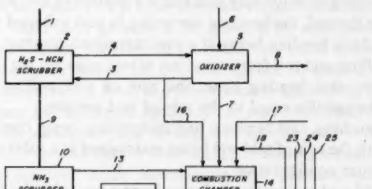
1. A method for reducing and substantially eliminating the presence of oxygen in a sealed container or package, which comprises disposing in said container liquid linseed oil retained or sorbed in a porous or particulate substrate material, said linseed oil-substrate combination being disposed in a protective capsule or ampul which includes openings to allow admission of oxygen into contact with the linseed oil, said linseed oil being present in an amount ranging from about 0.002 to about 0.02 cc/cc of air present in the package or container said amount being sufficient to react with substantially all of the oxygen in the container.

4,073,862

PROCESS FOR REMOVING AMMONIA, HYDROGEN SULFIDE AND HYDROCYANIC ACID FROM GASES

Egon Haese, Bochum-Linden, Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Continuation of Ser. No. 500,712, Aug. 26, 1974, abandoned.
This application June 14, 1976, Ser. No. 695,380
Claims priority, application Germany, Aug. 24, 1973, 2342757
Int. Cl.[2] C01B *17/16, 31/20*
U.S. Cl. 423—220 3 Claims



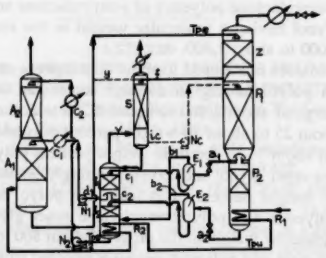
1. A process for removing ammonia, hydrogen sulfide and hydrocyanic acid from gases in which ammonia-containing condensates are also initially present, said process comprising subjecting the gas to be cleaned to a first washing step with an alkaline solution adapted to absorb hydrogen sulfide and hydrocyanic acid, said solution being selected from the group consisting of sodium and potassium salts and alkaline ammonia solutions, treating said solution with air following said first washing step to oxidize the hydrogen sulfide absorbed by the solution to form elemental sulfur and removing said sulfur, said air and ammonia absorbed thereby being continuously discharged from said oxidation step, diverting a portion of said treated solution following the oxidation step and recycling the remaining solution for reuse in said first washing step, the treated solution containing cyanide and sulfur compounds, subjecting the gas to be cleaned to a second washing step with an inorganic acid solution selected from the group consisting of sulfuric acid, hydrochloric acid and ammonium bisulfite to remove ammonia from the gas by formation of an ammonia salt solution, mixing at least a part of said ammonia salt solution with said diverted portion of the solution from the first washing step, supplying to said mixture the air and absorbed ammonia discharged from the oxidation step, burning said mixture with a fuel gas and said air at a temperature to decompose the ammonia and the cyanide containing constituents of the mixture to nitrogen, carbon dioxide and water vapor, and to convert said sulfur compounds to sulfur dioxide, recovering from the products of combustion any other components present therein including sulfur dioxide and said inorganic acid, separating said sulfur dioxide, recirculating said recovered acid for reuse in said second washing step, adding sulfur dioxide recovered from said products of combustion to the inorganic acid recovered from the products of combustion to be carried by said inorganic acid through the second washing step, diverting a portion of the resulting salt solution carrying a predetermined amount of sulfur dioxide, adding said diverted salt solution to said condensates with an alkali solution, distilling the mixture thus formed to separate ammonia therefrom, and burning said distilled ammonia with said mixture of solutions from the first and second washing steps to decompose the ammonia.

4,073,863

REGENERATION OF ABSORBENT SOLUTIONS USED FOR REMOVING GASEOUS ACID IMPURITIES FROM GASEOUS MIXTURES

Giuseppe Giammarco, and Paolo Giammarco, both of San Marco 3242, Piazzale Morolin, Venice, Italy

Filed Nov. 28, 1975, Ser. No. 635,823
Claims priority, application Italy, Nov. 28, 1974, 70464/74
The portion of the term of this patent subsequent to June 8, 1993, has been disclaimed.
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—222 43 Claims



1. In a process for eliminating and recovering gaseous impurities such as CO_2, H_2S, HCN, SO_2 from a gaseous mixture containing them by an absorption technique carried out at a temperature of from 40° to 135° C, wherein said gaseous mixture is brought into contact with an alkaline absorbing solution selected from the group consisting of solutions of alkali metal carbonate, alkali metal carbonate solutions activated by gly-

cine, an amino acid, ethanolamine or As_2O_3, amino acid solutions, ethanolamine solutions; solutions of alkali metal phosphates, sulfites, bisulfites and borates; and a regeneration step wherein the exhausted absorbing solution is regenerated by steam stripping and expulsion of the impurities previously absorbed, said regeneration step actually consisting of two columns, respectively a main column and a secondary column, the main column operating at a higher pressure than the secondary column, the improvement which comprises:

a. conveying substantially all the exhausted absorbing solution to the main column and regenerating the solution therein an in incomplete manner by means of externally supplied heat;.

b. conveying said solution to an expansion chamber and expanding said solution therein to thereby flash off steam;

c. conveying expanded solution (b) to said secondary column and treating said solution therein with the steam produced by said expansion (b) to thereby complete the regeneration of the solution in said secondary column;

d. extracting regenerated solution (c) from said secondary column and delivering it to the absorption stage;

e. discharging the steam issuing from the top of the secondary column, as well as from the top of the main column, together with the impurities desorbed.

4,073,864

METHOD OF DESULFURIZING EXHAUST EMISSION USING PULVERIZED SLAG AS ABSORBENT

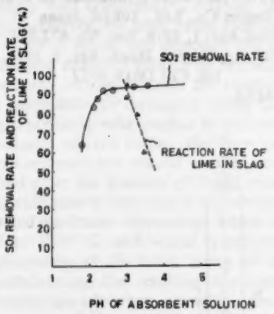
Masumi Atsukawa; Hiroyuki Ushio; Haruo Kuwabara, and Kyoji Kubo, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 577,404, May 14, 1975, abandoned, which is a continuation of Ser. No. 308,434, Nov. 21, 1972, abandoned. This application Feb. 26, 1976, Ser. No. 661,499

Claims priority, application Japan, Nov. 21, 1971, 46-93978

Int. Cl.[2] C01B *17/00*; C01F *1/00*

U.S. Cl. 423—242 **1 Claim**



1. A method for desulfurizing sulfur dioxide-containing exhaust gases containing oxygen which comprises pulverizing slag from a blast furnace, converter or open hearth furnace, said slag being principally composed of $Ca_2Al_2SiO_7$, suspending the resulting minute particles in water, contacting the aqueous suspension with the exhaust gases while supplying the slag at a rate to maintain the pH of the suspension within the range of 1.5 to 4.0 to thereby remove the sulfur dioxide from the exhaust and then filtering the thus contacted suspension to recover the gypsum product from the slag formed by the absorption of the sulfur dioxide.

4,073,865

SILICA POLYMORPH AND PROCESS FOR PREPARING SAME

Edith Marie Flanigen, White Plains, and Robert Lyle Patton, Katonah, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sept. 27, 1976, Ser. No. 726,744

Int. Cl.[2] C01B *33/12*

U.S. Cl. 423—339 **6 Claims**

1. A synthetic crystalline silica polymorph, said silica polymorph after calcination in air for at least 1 hour at 600° C., having a mean refractive index of 1.39 ± 0.01, a specific gravity at 25° C. of 1.70 ± 0.05 g./cc., an adsorptive capacity for water vapor at 23° C and a water vapor pressure of 4.6 mm Hg of less than 1 weight percent, having an infrared absorption spectrum which exhibits a substantial absence of absorption in the region 3700 to 3100 cm^{-1} and having an X-ray powder diffraction pattern containing at least those d-spacings set forth in Table A, said X-ray diffraction pattern being further characterized by the absence of a reflection intermediate the reflections which correspond to the d-spacings, 3.82 ± 0.04° A and 3.71 ± 0.02A.

2. Process for preparing the crystalline silica polymorph of claim 1 which comprises providing a reaction mixture having a pH between 7 and 11, and which in terms of moles of oxides contains from 150 to 1500 moles H_2O, from 13 to 50 moles of reactive SiO_2, from 0 to 20 moles M_2O where M represents an alkali metal, each of the aforesaid reactants being present per mole of Q_2O where Q represents a quaternary cation having the formula $(R_4X)^+$, in which each R represents hydrogen or alkyl group containing from 2 to 6 carbon atoms, and X represents phosphorus or nitrogen, said reaction mixture also containing from 2 to 12 moles of fluoride ion per mole of Q_2O heating the reaction mixture thus provided at a temperature of from 100° to 250° C. until a crystalline precursor is formed, isolating said crystalline precursor and calcining same at a temperature of from 400° to 1000° C. until the said crystalline silica polymorph is formed.

4,073,866

PROCESS FOR CONVERTING NITROGEN DIOXIDE INTO NITROGEN MONOXIDE

Naoomi Yamaki; Natsuko Futsuhara; Kazue Masuda, all of Kawaguchi, and Koji Tsuchimoto, Ichikawa, all of Japan, assignors to Agency of Industrial Science and Technology of Japan, Tokyo, Japan

Filed Oct. 18, 1976, Ser. No. 733,162

Claims priority, application Japan, Nov. 15, 1975, 50-137572

Int. Cl.[2] C01B *21/24*

U.S. Cl. 423—405 **5 Claims**

1. A process for selectively and quantitatively reducing nitrogen dioxide in a gas to nitrogen monoxide which comprises bringing a gas containing nitrogen dioxide into contact at a temperature within the range of 50°–400° C with a carbide of a metal selected from the group consisting of chromium, molybdenum, tungsten, vanadium, titanium, tantalum, silicon and boron or a composite carbide of said metals.

4,073,867

PROCESS FOR THE PRODUCTION OF CRYSTALLINE ZEOLITIC MOLECULAR SIEVES OF TYPE A

Wolfgang Roebke, Altenstadt; Dieter Kneitel, and Erfried Parr, both of Rodenbach, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt and Henkel u. Cie GmbH, Dusseldorf-Holthausen, both of, Germany

Filed Mar. 30, 1976, Ser. No. 671,950

Claims priority, application Germany, Apr. 18, 1975, 2517218

Int. Cl.[2] C01B *33/28*

U.S. Cl. 423—429 **10 Claims**

1. A process for producing a crystalline zeolitic molecular sieve of Type A with the composition

$$1.0 \pm 0.2\ Na_2/nO : Al_2O_3 : 1.85 \pm 0.5\ SiO_2 \cdot y\ H_2O$$

where y has a value up to 6 having particles with at least 99.5 weight % below 30μ diameter, as well as at least 90 weight % under 10μ and with 50 weight % below 6.5μ and having the particle spectrum

Fraction (μ)	Portion (weight %)
<5	25–35
<10	90–93
<15	91–97
<20	93–98

comprising hydrothermally crystallizing a sodium aluminate silicate by pouring together while stirring an aqueous sodium silicate solution and a first aqueous sodium aluminate liquor containing 1 to 100 g Al_1O_3/l and 10 to 200 g Na_2O/l, allowing the synthesis premixture formed having the molar ratios

SiO_2/Al_2O_3	3.4 to 50:1
Na_2O/SiO_2	0.2 to 20:1
H_2O/Na_2O	4 to 300:1

to solidify to a gel, adding to this gel a second and more highly concentrated aqueous sodium aluminate liquor containing up to 200 g Al_2O_3/l and up to 250 g Na_2O/l at a temperature between 10° and 100° C while stirring, allowing the thus obtained synthesis mixture to crystallize at a temperature between 20° and 175° C within 15 minutes.

4,073,868

CARBON BISULFIDE PRODUCTION

Morton Meadow, Trenton, and Sidney Berkowitz, Highland Park, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 355,991, April 30, 1973, Pat. No. 3,927,185. This application Sept. 19, 1975, Ser. No. 615,002
The portion of the term of this patent subsequent to Dec. 16, 1992, has been disclaimed.
Int. Cl.[2] C01B *31/26*
U.S. Cl. 423—443 **9 Claims**

1. Process for producing carbon bisulfide by the reaction of sulfur and a hydrocarbon in gaseous state in which a stream of higher hydrocarbon gas comprising a higher hydrocarbon having at least 3 carbon atoms is introduced into a stream of sulfur vapor in a reactor to form a hot reaction mixture whereby to react on-catalytically said sulfur and hydrocarbon to form carbon bisulfide in said reactor, said reactor having solid walls, wherein the improvement comprises moving said reaction mixture vertically from the zone of introduction of said hydrocarbon stream, the flow conditions and mixing conditions of the sulfur stream and hydrocarbon stream being such that the hydrocarbon stream becomes substantially completely mixed with sulfur vapor before the hydrocarbon comes into contact with a solid surface in the reaction zone, so that a non-catalytic reaction occurs between substantially all the higher hydrocarbon and sulfur prior to such contact.

9. Process for producing carbon bisulfide by the reaction of sulfur and a hydrocarbon in gaseous state, wherein the improvement comprises feeding to a reaction zone a stream of sulfur vapor and a stream of hydrocarbon gas comprising a higher hydrocarbon having at least 3 carbon atoms countercurrent to impinge said streams on each other in said reaction zone at a temperature at which the reaction said sulfur and said hydrocarbon to form carbon bisulfide occurs, and in which said reaction zone is at a pressure of at least 3.5 atmospheres, said hydrocarbon stream being directed substantially head-on at said sulfur vapor stream, said sulfur vapor stream is passed downstream through a tube within which a stream of said hydrocarbon is directed substantially axially of said tube and the resulting mixture passes through said tube downstream of the point at which said hydrocarbon stream comes into contact with the sulfur, the temperature of the walls of said tube is below about 750° C, the flow conditions and mixing conditions of the sulfur stream and hydrocarbon stream being such that the hydrocarbon stream becomes substantially completely mixed with sulfur vapor before the hydrocarbon comes into contact with a solid surface in the reaction zone, so that a noncatalytic reaction occurs between substantially all the higher hydrocarbon and sulfur prior to such contact.

4,073,869

INTERNAL CHEMICAL MODIFICATION OF CARBON FIBERS TO YIELD A PRODUCT OF REDUCED ELECTRICAL CONDUCTIVITY

Ilmar L. Kalnin, Millington, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed June 5, 1975, Ser. No. 584,098
Int. Cl.[2] D01F *9/12*; D06B *19/00*; C08K *3/04*
U.S. Cl. 423—447.1 **23 Claims**

1. An improved process for the internal chemical modification of a carbonaceous fibrous material comprising at least 90 percent carbon by weight comprising:

(a) contacting said fibrous material for about 5 to 120 minutes with a strong acid medium consisting essentially of nitric acid at a temperature of about 60° to 95° C. wherein the mole ratio of nitric acid to sulfuric acid present in said medium ranges between about 1 to 0 and 1 to 8 and the concentration of water in said acid medium ranges from 0 to 35 mole percent based upon the total mole concentration of said acids and said water, and

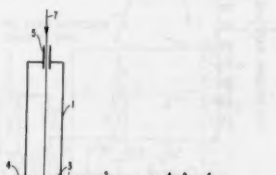
(b) removing excess acid adhering to the resulting carbonaceous fibrous material to yield a fibrous product containing about 3 to 30 percent bound oxygen by weight which exhibits a substantially reduced electrical conductivity by at least 40 percent when compared to that of the carbonaceous fibrous material prior to said contact and a single filament tenacity of at least 200,000 psi.

4,073,870

PROCESS FOR PRODUCING CARBON FIBERS

Yasuo Saji; Hideo Kurioka, both of Mishima; Kozo Tanaka, Numazu, and Hiroyasu Ogawa, Shizuoka, all of Japan, assignors to Toho Beslon Co., Ltd., Tokyo, Japan

Filed Apr. 1, 1976, Ser. No. 672,824
Claims priority, application Japan, Apr. 2, 1975, 50-39912
Int. Cl.[2] D01F *9/12*
U.S. Cl. 423—447.6 **10 Claims**



1. A process for producing carbon fibers which comprises feeding an inert gas into each of a vertical furnace maintained at about 500° C to about 1,000° C and a transverse furnace maintained at about 800° to about 2,000° C connected thereto so that the inert gas flows from the transverse furnace toward the bottom and then the top of the vertical furnace, and feeding preoxidized organic polymer fibers from the top of the vertical furnace to pass the fibers countercurrent to the inert gas flow

through the two furnaces to thereby carbonize the fibers and obtain said carbon fibers, wherein:

during the entire process within the vertical and transverse furnace the advancing direction of the fibers treated is countercurrent to the direction in which the inert gas flows;

volatile components are generated in high amounts at the upper portion of the vertical furnace and there is substantially no generation of volatile components in the transverse furnace; and

the feeding of the preoxidized fibers and the discharging of the inert gas containing the volatile components are carried out through the same slit whose temperature is maintained at about 200° to 400° C.

4,073,871

JOINT COMBUSTION OF OFF-GASES AND LIQUID RESIDUES CONTAINING CHLORINATED HYDROCARBONS WITH HYDROCHLORIC ACID RECOVERY

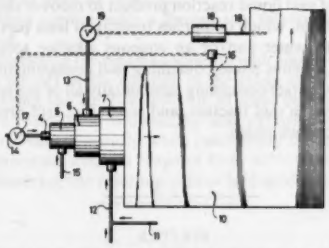
Wolfgang Optiz, Hurth-Alstadten, and Hans Hennen, Hurth, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 15, 1977, Ser. No. 777,718

Claims priority, application Germany, Mar. 19, 1976, 2611671

Int. Cl.² C01B *7/08*

U.S. Cl. 423—481 **9 Claims**



1. A process for the joint combustion of off-gases and liquid residues containing chlorinated hydrocarbons, which comprises forming a mist comprising a mixture of off-gases and atomised liquid residues, the latter being atomised by means of at least one of air or steam, and directing this mist into a preheated combustion chamber lined with refractory bricks, the said mixture being introduced into the combustion chamber jointly with combustion air through a burner having four feed pipes arranged coaxially with respect to each other and terminating in conically tapered outlets, the three outer feed pipes defining three separate and coaxial annular zones around the innermost feed pipe; the quantity of liquid residue fed in and burned being sufficient to maintain in the combustion chamber a predetermined maximum temperature which is not above the range 1200° to 1800° C, and which is compatible with the refractory properties of the brick lining of the combustion chamber; withdrawing the resulting hot combustion gases from the combustion chamber, quenching these combustion gases with water, and recovering hydrochloric acid from the aqueous solution resulting from the quenching of the combustion gases.

4,073,872

PROCESS FOR PRODUCING A PRODUCT CONTAINING ALUMINUM AND CHLORINE

Edward Max Adolf Willhoft, 6 Rosebery Road, Langley Vale, Epsom Downs, Surrey, England

Filed Apr. 27, 1976, Ser. No. 680,860

Int. Cl.² C01F *7/56, 7/60, 7/00*

U.S. Cl. 423—496 **3 Claims**

1. In a process for preparing a product containing aluminum and chlorine by chlorinating a mixture of an aluminum-containing mineral and carbon and recovering aluminum chloride, the improvement wherein a dried paper sludge, said dried paper sludge containing a carbonizable organic material in the form of organic fibres in intimate association with an aluminum-containing mineral selected from the group consisting of an oxide of aluminum and an aluminosilicate in finely divided form, is heated to a temperature of 500° to 1000° C to carbonize the organic fibers, the solid residue from the carbonization step is chlorinated, and a product containing aluminum and chlorine is recovered.

4,073,873

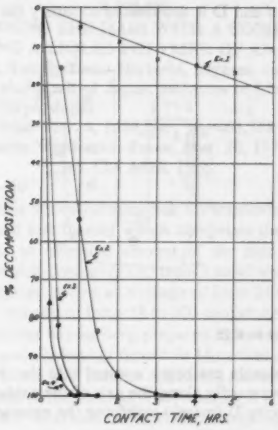
CATALYTIC DECOMPOSITION OF HYPOCHLORITE

Donald Lee Caldwell, Lake Jackson, and Raymond John Fuchs, Jr., Richwood, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 29, 1976, Ser. No. 671,532

Int. Cl.² C01D *3/04*; C01B *13/02, 7/08, 9/02*

U.S. Cl. 423—499 **9 Claims**



1. In a process of catalytically decomposing hypochlorites into oxygen and chloride, wherein said hypochlorites are of the group consisting of hypochlorous acid and metal salts of hypochlorous acid, and are in aqueous solution at a pH of not less than about 5.0 said process comprising contacting the hypochlorites with an oxide of cobalt as the catalyst, the improvement which comprises using single-metal spinel Co_3O_4 as the catalyst.

4,073,874

RECOVERY OF CHLORINE FROM IRON CHLORIDE

Seitaro Fukushima, Omiya, Japan, assignor to Mitsubishi Kinzoku K.K., Tokyo, Japan

Continuation-in-part of Ser. No. 574,043, May 2, 1975, abandoned, which is a continuation of Ser. No. 463,838, April 24, 1974, abandoned. This application Dec. 17, 1975, Ser. No. 641,583

Claims priority, application Japan, Apr. 28, 1973, 48-48941

Int. Cl.² C01B *7/03, 7/02*; C01G *49/06*

U.S. Cl. 423—500 **10 Claims**

1. In the process for the recovery of chlorine by causing an oxidizing gas selected from the group consisting of oxygen and a gas containing molecular oxygen and as the predominant constituent to react with an iron chloride gas selected from the group consisting of iron chloride in the vapor state and a gas containing iron chloride as the predominant constituent within an oxidation furnace, the improvement according to which the initial meeting of the iron chloride gas and the oxidizing gas is

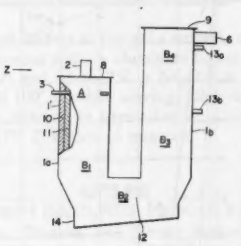
caused to occur in an unobstructed spaced within the oxidation furnace, and the oxidizing gas is introduced into the furnace in a direction and at a velocity such that turbulent flow induced by collision of said two gases will not reach the furnace walls, said improvement being achieved by conducting the reaction in an oxidation furnace which comprises:

a closed furnace structure of the vertical cylindrical type having a diameter of D (*m*) comprising a top end wall, a side wall and a bottom extraction port for withdrawing the product iron oxide,

an iron chloride conduit for injecting the iron chloride gas having a diameter of *d* (*m*) and being mounted at the central part of said top end wall coaxially with the furnace structure,

a plurality of oxygen nozzles for injecting the oxidizing gas said nozzles having a radius of $v_0(m)$ and being disposed radially and inwardly on said side wall at equiangular intervals from each other, the tips of the oxygen nozzles being directed to a point on the axis of the furnace structure, and

an exhaust pipe for discharging product gases out of the oxidation furnace said pipe being disposed at a position on the side wall close to the lower end of the side wall, wherein *d* and D is determined to satisfy the equation



$$d/D = 0.1 \text{ to } 0.25 \quad (1);$$

the iron chloride gas being injected into the oxidation furnace downwardly along the axis of the oxidation furnace at a velocity U (m/sec) satisfying the equation

$$Re = Ud/\nu = (2.1 \text{ to } 8.9) \times 10^4 \quad (2)$$

wherein *Re* denotes the Reynolds number of the iron chloride gas passing through the iron chloride conduit, ν is the kinematic viscosity of the iron chloride gas; and

the oxidizing gas being injected into the oxidation furnace through the oxygen nozzles at a substantially equal velocity Uo (m/sec) satisfying the formulas

$$0.1 \leqq Uc/U \leqq 6 \quad (3)$$

and

$$Uo = (DUc)/(24.8\nu_o) \quad (4)$$

wherein Uc (m/sec) denotes the velocity of the free turbulence of the oxidizing gas at the central axis of the furnace, whereby deposition of Fe_2O_3 on the furnace walls is minimized.

4,073,875

OXIDATION OF MAGNESIUM CHLORIDE

Max Hans Feilchenfeld, Jerusalem, Israel, assignor to Yissum Research Development Co. of the Hebrew Univ., Jerusalem and Israel Chemicals Ltd., Tel-Aviv, both of, Israel

Filed June 18, 1976, Ser. No. 697,540
Claims priority, application Israel, July 4, 1975, 47643
Int. Cl.[2] C01B *7/03*; C01F *5/02*
U.S. Cl. 423—504 **8 Claims**

1. In a process for the production of chlorine and magnesium oxide by oxidation of magnesium chloride with a gas comprising oxygen the improvement consisting at elevated temperatures of 750°–900° C in performing an exothermic reaction of magnesium chloride in a molten state in the form of a thin film on a support consisting of substantially anhydrous particulate magnesium oxide, said reaction being carried out with substantially anhydrous gas comprising oxygen.

4,073,876

PREPARATION OF GLYCOL ESTERS

Vijai P. Gupta, Freehold, N.J., assignor to Halcon International, Inc., New York, N.Y.

Filed July 1, 1976, Ser. No. 701,464
Int. Cl.[2] C07C *67/05*; C01B *19/00*
U.S. Cl. 423—508 **3 Claims**

1. A process for recovering tellurium values and removing contaminating metal components from a high-boiling tellurium-containing fraction obtained from the liquid reaction product produced in the manufacture of glycol esters by the molecular oxygen oxidation of an olefin in the presence of a carboxylic acid and a tellurium catalyst and containing contaminating metals in addition to the tellurium values, said high-boiling fraction comprising the highest boiling fraction produced by distillation of said liquid reaction product to recover the glycol esters therefrom, which comprises treating at least part of said fraction with water and/or an aqueous alkaline solution to produce an aqueous phase containing said contaminating metals and a precipitate containing substantially all of the tellurium values present in said fraction, and separating said precipitate from said aqueous phase.

4,073,877

MANUFACTURE OF TITANIUM DIOXIDE PIGMENT SEED FROM A TITANIUM SULFATE SOLUTION

Edgar Klein, Odenthal; Reinhard Kracke, Opladen; Walter Nespital, Odenthal, all of Germany, and Rüdiger Paul, deceased, late of Leverkusen, Germany, assignors to Kronos Titan G.m.b.H., Leverkusen, Germany

Filed May 27, 1975, Ser. No. 581,217
Claims priority, application Germany, July 26, 1974, 2435955
Int. Cl.[2] C01G *23/06*
U.S. Cl. 423—616 **6 Claims**

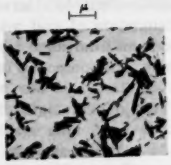
1. In a process for preparing nuclei for use in the manufacture of titanium dioxide pigment by hydrolysis of a titanium sulfate solution wherein the nuclei is formed by mixing a titanium sulfate solution with an alkaline-reacting substance followed by curing the mix at elevated temperature, the improvement comprising the steps of: first adding titanium sulfate solution to water at temperatures between room temperature and 80° C. and in amount to form a dilute, aqueous sulfate solution having a maximum TiO_2 concentration of about 5 gpl, admixing an alkaline-reacting solution with said dilute aqueous solution in an amount to form an acid mixture having a pH from 2.5 to 3.0, thereafter adding additional titanium sulfate solution and additional alkaline-reacting solution to said acid mixture, said additional titanium sulfate solution and said additional alkaline-reacting solution being added simultaneously at temperatures between 50° C. and 80° C., at rates sufficient to maintain the pH of the resulting mixture substantially constant within the range of from 2.5 to 3.0, and in amounts to achieve TiO_2 concentration of from 10 to 100 gpl TiO_2, and thereafter curing the concentrated mixture.

4,073,878

METHOD FOR PRODUCING YELLOW HYDRATED FERRIC OXIDE

Tatsukiyo Otsuki, 9-25, Saiwaicho, and Sinya Takata, 401, Nishikawahara, both of Okayama, Japan

Filed Sept. 9, 1975, Ser. No. 611,642
Int. Cl.[2] C01G *49/02*
U.S. Cl. 423—633 7 Claims



1. A method for producing yellow hydrated ferric oxide which comprises

(a) forming a mixed solution containing ammonium salt and ferrous salt, wherein the ammonium ion concentration of the solution is at least 30 g/l,

(b) adding ammonia to partially neutralize the solution and oxidizing the solution with air to obtain a seed liquid, the temperature of the solution being maintained within a range of from 25° – 40° C,

(c) adding continuously a ferrous salt solution to the seed liquid,

(d) neutralizing the resulting solution with ammonia to maintain the pH of the solution in the range of 4.0 – 6.5 and oxidizing the solution with air to form yellow hydrated ferric oxide, the neutralizing and oxidizing being conducted simultaneously while maintaining the solution at a temperature within a range of from 45° – 60° C, and

(e) recovering the resulting yellow hydrated ferric oxide.

4,073,879

BROMINATED PERFLUOROCARBON RADIOPAQUE AGENTS

David M. Long, Jr., El Cajon, Calif., assignor to University of Illinois Foundation, Urbana, Ill.

Continuation-in-part of Ser. No. 500,463, Aug. 26, 1974, Pat. No. 3,975,512, which is a continuation of Ser. No. 100,408, Dec. 21, 1970, abandoned. This application Aug. 16, 1976, Ser. No. 714,392
The portion of the term of this patent subsequent to Aug. 17, 1993, has been disclaimed.
Int. Cl.[2] A61K *29/02*
U.S. Cl. 424—5 13 Claims

1. In a process for radiologically examining a part of the body of an animal, the improvement comprising contacting said body part with an effective amount of a radiopaque agent comprising a dibrominated aliphatic perfluorocarbon or a brominated cyclic perfluorocarbon.

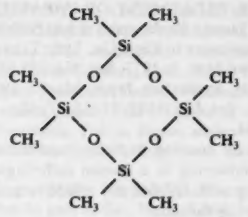
4,073,880

ANTIPERSPIRANT SOLUTION CONTAINING A SUBSTANTIALLY VOLATILE POLYDIMETHYL SILOXANE LIQUID

Morton Pader, Teaneck, and William Netzbandt, Dumont, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Filed Aug. 15, 1975, Ser. No. 605,376
Int. Cl.[2] A61K *7/34, 7/38*
U.S. Cl. 424—66 12 Claims

1. An antiperspirant solution suitable for pump spray or roll-on application consisting essentially of an alcohol soluble aluminum chlorhydroxide complex; a sufficient amount of a polydimethyl siloxane of the structural formula



to substantially reduce the tackiness of said complex during drying; and a sufficient amount of alcohol to result in said solution; said composition being characterized by having substantially reduced tackiness and giving a preception of quick drying when applied from a pump spray or a roll-on applicator.

4,073,881

CONDITIONING THE HAIR WITH A COMPOSITION CONTAINING A LIQUID POLYMER OF AN α-OLEFIN

Makoto Imai, Tokyo; Teruo Horiuchi, Sayama, and Ichiro Kashiwa, Kokubunji, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1976, Ser. No. 663,735
Claims priority, application Japan, Mar. 20, 1975, 50-33625
Int. Cl.[2] A61K *7/08*
U.S. Cl. 424—70 11 Claims

1. The method of conditioning hair for improving the lustre, combability and feel thereof which comprises the step of applying to hair an effective amount of the hair conditioner composition which comprises (A) from 1 to 40 weight percent of a liquid polymer having an average of from 24 to 60 carbon atoms and a viscosity of from 18 to 200 centistokes at 37.8° C, said liquid polymer having been prepared by cationic polymerization of an α-olefin having from 6 to 14 carbon atoms, in the presence of a Lewis acid catalyst consisting essentially of (a) an aluminum halide of the formula AlX_3 wherein X is halogen and (b) an etherified, esterified or etherified-esterified polyhydric alcohol or ketone, followed by removal of the catalyst and substances having less than 20 carbon atoms, (B) from 0.5 to 25 weight percent of a surface active agent effective for homogeneously emulsifying or dispersing component (A), said surface active agent being selected from the group consisting of anionic organic surfactants, nonionic organic surfactants, cationic organic surfactants and mixtures thereof, with the proviso that the composition does not contain both an anionic organic surfactant and a cationic organic surfactant, and (C) from 20 to 95 weight percent of water.

4,073,882

5-METHYL-3-M-BUTYL-OCTAHYDROINDOLIZINE AS AN ATTRACTANT FOR ANTS

Fridolin J. Ritter, Waddinxveen, Netherlands, assignor to Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek Ten Behoeve Van Nijverheid Handel en Verkeer, The Hague, Netherlands

Continuation of Ser. No. 459,358, April 9, 1974, abandoned. This application Jan. 5, 1976, Ser. No. 646,611
Claims priority, application United Kingdom, Apr. 19, 1973, 18990/73
Int. Cl.[2] A01N *17/14;* C07D *211/06*
U.S. Cl. 424—84 4 Claims

1. A process for attracting Pharaoh's ants, *Monomorium pharaonis* L, which comprises applying the compound 5-methyl-3-n-butyl-octahydroindolizine to a location frequented by the ants in an amount effective to attract the ants.

4,073,883

METHOD FOR TREATMENT OF IMPAIRED HEARING

Koichi Yasuda; Yusuke Ikeda, and Yukiaki Nishida, all of Fukuoka, Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

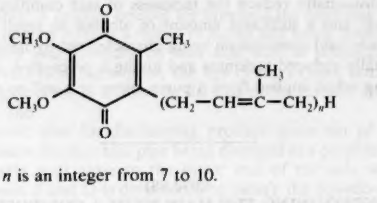
Filed Mar. 2, 1977, Ser. No. 773,671

Claims priority, application Japan, Mar. 5, 1976, 51-23165

Int. Cl.[2] A61K *31/12, 37/48*

U.S. Cl. 424—94 **7 Claims**

1. A method for treating partially impaired hearing which comprises administering to a human suffering from partially impaired hearing a therapeutically effective amount of Coenzyme Q having the formula:



wherein *n* is an integer from 7 to 10.

4,073,884

PROMOTION OF FEED EFFICIENCY

Frank Joseph Hartdegen, and Kamal Mohammad Abdo, both of Columbia, Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 726,632, Sept. 27, 1976, abandoned. This application Dec. 9, 1976, Ser. No. 749,001

Int. Cl.[2] A61K *37/48*

U.S. Cl. 424—94 **7 Claims**

1. A method of increasing the feed efficiency of pigs, chickens and turkeys comprising administering an effective amount of an enzyme fraction obtained by culturing *Streptomyces griseus* strain NRRL 5747 in a fermentation medium to obtain a fraction having the following characteristics:

(a) 1 g. of the enzymatic fraction represents about 500 units, 1 unit being that amount of enzyme fraction which when dissolved in 1 ml. of water reduces the viscosity of 1 ml. of prepared gastric mucin by 50% in 2 hours at 39° C.;

(b) said fraction is insoluble in acidic acetone;

(c) centrifuged broth from the fermentation medium contains 0.3-1.0 units of enzyme fraction/mg. broth;

(d) storage of the dry enzyme fraction at 109° F. for 28 weeks or at 122° F. for 8 weeks results in less than 10% activity decrease.

4,073,885

ANODYNIN, AN ENDOGENOUS OPIATE ANALGESIC FROM HUMAN BLOOD, AND PROCESS FOR RECOVERING SAME

Candace B. Pert; Agu Pert, both of Bethesda, Md., and John F. Tallman, Washington, D.C., assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Sept. 10, 1976, Ser. No. 722,207

Int. Cl.[2] A61K *35/14, 37/00*

U.S. Cl. 424—101 **3 Claims**

1. A method of recovering and purifying from human plasma an endogenous composition called anodynin having morphine agonist properties, which comprises acidifying said plasma to a pH of about 3.0 and heating said plasma, adjusting the pH to about 9.0 and recovering a precipitate, extracting said precipitate into butanol to recover anodynin from said butanol extract and reducing to dryness and subsequently purifying said anodynin by centrifuging and ion exchange column separation.

4,073,886

BLOOD FRACTIONATION PROCESS USING BLOCK COPOLYMERS OF ETHYLENE OXIDE AND POLYOXYPROPYLENE

Walter C. Kehm, Scarsdale, N.Y., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jan. 30, 1973, Ser. No. 327,892

Int. Cl.[2] A61K *37/02;* C07G *7/00*

U.S. Cl. 260—112 B **7 Claims**

1. A process for fractionating blood serum and plasma comprising selective precipitation of said material by admixing with a precipitating amount from about 1% to about 35% on a weight per volume basis of a compound of the formula

$$HO(CH_2CH_2O)_a(\underset{\displaystyle CH_3}{\underset{|}{C}}HCH_2O)_b(CH_2CH_2O)_cH$$

wherein *a* and *c* are integers such that the hydrophile portion represented by (CH_2CH_2O) constitutes at least about 50% of the molecule and *b* is an integer such that the hydrophobic portion represented by

$$(\underset{\displaystyle CH_3}{\underset{|}{C}}HCH_2O)$$

has a molecular weight of at least about 950.

4,073,887

COMPOSITION FOR TREATING INGROWN TOENAILS

Ellis J. McLean, Sr., Moultrie, Ga., assignor to Edward Price McLean, Sr., Moultrie, Ga.

Continuation-in-part of Ser. No. 331,094, Feb. 9, 1973, abandoned. This application Aug. 7, 1974, Ser. No. 495,531

Int. Cl.[2] A61K *33/26*

U.S. Cl. 424—147 **5 Claims**

1. A process for treating unguis incarnatus comprising the steps of:

(a) applying to the nail and the skin area adjacent thereto of a person suffering from unguis incarnatus, a topical composition consisting essentially of ferric subsulfate solution;

(b) maintaining said ferric subsulfate in contact with the affected onyx and skin area adjacent thereto for several hours; and

(c) repeating steps (a) and (b) at least once daily for several days until the symptoms of said unguis incarnatus are substantially alleviated.

4,073,888

CHLORINE DIOXIDE AND QUATERNARY AMMONIUM SALTS AS STERILIZING AGENTS

Martin Snyder, Elizabeth, N.J., assignor to Pettibone Laboratories, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 480,335, June 18, 1974, abandoned, which is a continuation-in-part of Ser. No. 244,856, April 17, 1972, abandoned. This application Feb. 24, 1975, Ser. No. 552,517

Int. Cl.[2] A01N *9/02, 9/20, 11/00*

U.S. Cl. 424—149 **9 Claims**

1. A sporicidal composition which comprises from 1.0 to 6.0% chlorine dioxide and a small amount but effective amount of about 0.2% up to about 2.0% of a quaternary ammonium salt selected from the group consisting of octyl-decyl dimethyl ammonium chloride, didecyl dimethyl ammonium chloride, didodecyl dimethyl ammonium chloride, and octyl-dodecyl dimethyl ammonium chloride.

4,073,889

METHOD FOR PREVENTING AEROBIC DECOMPOSITION PROCESSES IN FERMENTATED FODDER

Theodor Beck, Munich, and Friedrich Gross, Grub, both of Germany, assignors to Plate Kofasil Gesellschaft mit beschrankter Haftung, Bonn, Germany

Filed Feb. 18, 1976, Ser. No. 659,094
Claims priority, application Germany, Feb. 19, 1975, 2507067
Int. Cl.[2] A01N *13/00*
U.S. Cl. 424—164 5 Claims

1. A method of preventing aerobic decomposition processes in fermented fodder, wherein benzoic acid and its salts, sodium or calcium formate and alkali salts of sulphurous acid are added either individually or in admixture to the fodder during storage or to the silage after removal from storage, in such quantity that the fermented fodder contains in synergistic combination from 300 to 600 ppm of benzoic acid, from 1000 to 2500 ppm of sodium or calcium formate and from 100 to 250 ppm of salts of sulphurous acid.

4,073,890

NOVEL POLYPEPTIDES

Masahiko Fujino, Takarazuka; Mitsuhiro Wakimasu; Shigehisa Taketomi, both of Suita, and Eiichiro Ishikawa, Nishinomiya, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 560,092, March 19, 1975, Pat. No. 4,001,199. This application Sept. 23, 1976, Ser. No. 726,052
Claims priority, application Japan, Mar. 26, 1974, 49-34161; Jan. 24, 1975, 50-10878
The portion of the term of this patent subsequent to Jan. 4, 1994, has been disclaimed.
Int. Cl.[2] A61K *37/00;* C07C *103/52*
U.S. Cl. 424—177 21 Claims

1. A composition for the treatment of diabetes or hypercholesteremia which comprises a medicinally effective amount of an active ingredient of the formula

$$R_1—Arg—R_2—Phe—Phe—R_3 \quad (I)$$

wherein R_1 is hydrogen, or a basic or neutral amino acid residue having not more than 10 carbon atoms, R_2 is a neutral amino acid residue having not more than 10 carbon atoms and R_3 is NH_2, Tyr-NH_2, a residue of Tyr[1]-peptide consisting of 2 to 5 amino acid residues, each of the amino acid residues having 2 to 10 carbon atoms, or R_3 is a residue of an amide of the Tyr[1]-peptide, provided that when R_1 is hydrogen, R_2 is Pro and that when any of the amino acid residues constituting the compound of the formula (I) is an optical isomer, the amino acid residue is in L-configuration, in admixture with a pharmaceutically effective carrier therefor.

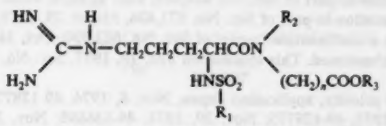
4,073,891

N^2-ARYLSULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

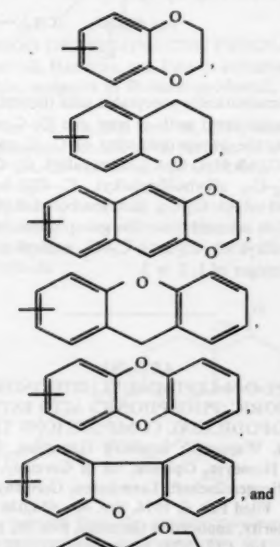
Shosuke Okamoto, 15-1i, Asahigaoka 3-chome, Tarumi, Kobe, Hyogo, Japan; Akiko Hijikata, Kobe, Japan; Ryoji Kikumoto, Machida, Japan; Yoshikuno Tamao, Yokohama, Japan; Kazuo Ohkubo, Machida, Japan; Tohru Tezuka, Yokohama, Japan, and Shinji Tonomura, Tokyo, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo and Shosuke Okamoto, both of Japan

Continuation-in-part of Ser. No. 669,743, March 24, 1976, which is a continuation-in-part of Ser. No. 671,568, March 29, 1976, which is a continuation-in-part of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Jan. 19, 1977, Ser. No. 760,667
Claims priority, application Japan, Nov. 8, 1974, 49-128774; Nov. 8, 1974, 49-128775; Nov. 29, 1974, 49-136695; Nov. 29, 1974, 49-136697; Feb. 25, 1975, 50-023268; Feb. 26, 1975, 50-023635
The portion of the term of this patent subsequent to Jan. 24, 1995, has been disclaimed.
Int. Cl.[2] A61K *37/00;* C07C *103/52*
U.S. Cl. 424—177 4 Claims

1. N^2-arylsulfonyl-L-argininamides having the formula (I):



and the pharmaceutically acceptable salts thereof, wherein R_1 is selected from the group consisting of naphthyl, 5,6,7,8-tetrahydronaphthyl, naphthyl substituted with at least one substituent selected from the group consisting of halo, nitro, cyano, hydroxy and C_1–C_{10} alkyl phenyl, phenyl substituted with at least one substituent selected from the group consisting of halo, nitro, cyano, hydroxy, and C_1–C_{10} alkyl, C_1–C_{10} alkoxy and C_2–C_{20} dialkylamino, C_7–C_{12} aralkyl,



wherein R_4 is hydrogen, C_1–C_{10} alkyl or C_1–C_{10} alkoxy; R_2 is selected from the group consisting of C_2–C_{10} alkyl, C_3–C_{10} alkenyl, C_3–C_{10} alkynyl, C_2–C_{10} alkoxyalkyl, C_2–C_{10} alkylthioalkyl, C_2–C_{10} alkylsulfinylalkyl, C_1–C_{10} hydroxyalkyl, C_2–C_{10} carboxyalkyl, C_3–C_{10} alkoxycarbonylalkyl, C_1–C_{10} haloalkyl, C_7–C_{15} aralkyl, C_8–C_{15} α-carboxyaralkyl, C_3–C_{10} cycloalkyl and C_4–C_{10} cycloalkylalkyl; R_3 is selected from the group consisting of C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7–C_{12} aralkyl and 5-indanyl; and *n* is an integer of 1, 2 or 3.

4,073,892

N²-ALKOXYNAPHTHYLSULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Shosuke Okamoto, 15-1i, Asahigaoka 3-chome, Tarumi, Kobe, Hyogo, Japan; Akiko Hijikata, Kobe, Japan; Ryoji Kikumoto, Machida, Japan; Yoshikuno Tamao, Yokohama, Japan; Kazuo Ohkubo, Machida, Japan; Tohru Tezuka, Yokohama, Japan, and Shinji Tonomura, Tokyo, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo and Shosuke Okamoto, both of Japan

Continuation-in-part of Ser. No. 638,985, Dec. 9, 1975, which is a continuation-in-part of Ser. No. 671,436, March 29, 1976, which is a continuation-in-part of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Jan. 19, 1977, Ser. No. 760,738

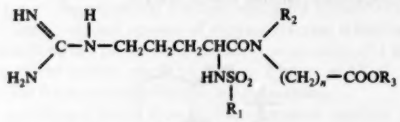
Claims priority, application Japan, Nov. 8, 1974, 49-128774; Nov. 8, 1974, 49-128775; Nov. 29, 1974, 49-136695; Nov. 29, 1974, 49-136697; Feb. 25, 1975, 50-023268; Feb. 26, 1975, 50-023635

The portion of the term of this patent subsequent to Oct. 25, 1994, has been disclaimed.

Int. Cl.[2] **A61K** *37/00;* **C07C** *103/52*

U.S. Cl. 424—177 **10 Claims**

1. N^2-alkoxynaphthylsulfonyl-L-argininamides having the formula:



and the pharmaceutically acceptable salts thereof, wherein R_1 is naphthyl substituted with at least one C_1–C_5 alkoxy; R_2 is selected from the group consisting of C_2–C_{10} alkyl, C_3–C_{10} alkenyl, C_3–C_{10} alkynyl, C_2–C_{10} alkoxyalkyl, C_8–C_{15} α-carboxyaralkyl, C_2–C_{10} alkylsulfinylalkyl, C_1–C_{10} hydroxyalkyl, C_2–C_{10} carboxyalkyl, C_3–C_{10} alkoxycarbonylalkyl and C_1–C_{10} haloalkyl; R_3 is selected from the group consisting of hydrogen, C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7–C_{12} aralkyl and 5-indanyl; and *n* is an integer of 1, 2 or 3.

4,073,893

O-ALKYL-O-[4-LEPIDIN(6)YL]-(THIONO)(THIOL) PHOSPHORIC (PHOSPHONIC) ACID ESTERS AND ARTHROPODICIDAL COMPOSITIONS THEREOF

Christa Fest, Wuppertal; Ingeborg Hammann, Cologne, and Bernhard Homeyer, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

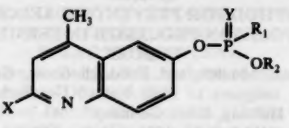
Filed Feb. 6, 1976, Ser. No. 656,036

Claims priority, application Germany, Feb. 25, 1975, 2508078

Int. Cl.[2] **C07D** *9/60;* **A61K** *31/675*

U.S. Cl. 424—200 **10 Claims**

1. An O-alkyl O-[4-lepidin(6)yl]-(thiono)(thiol)-phosphoric(-phosphonic) acid ester of the formula



in which

R_1 is alkyl or alkoxy, each with 1 to 6 carbon atoms, phenyl or n-propylmercapto,

R_2 is alkyl with 1 to 6 carbon atoms,

X is chlorine or hydrogen, and

Y is oxygen or sulfur.

10. The method according to claim **9**, in which said compound is

methyl O-ethyl O-[4-lepidin(6)yl]-thionophosphonic acid ester,

ethyl O-ethyl O-[4-lepidin(6)yl]-thionophosphonic acid ester,

O-ethyl S-n-propyl O-[4-lepidin(6)yl]-thionophosphoric acid ester,

O-ethyl S-n-propyl O-[2-chloro-4-lepidin(6)yl]-thionophosphoric acid ester or

O,O-diethyl O-[4-lepidin(6)yl]-thionophosphoric acid ester.

4,073,894

OXADIAZOLIDINE SUBSTITUTED PHOSPHORUS COMPOUNDS

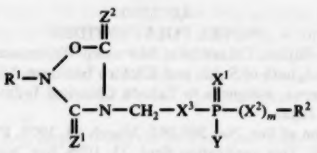
Leonard J. Stach, Riverside, and Robert N. Wilke, Chicago, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 656,493, Feb. 23, 1976, abandoned. This application Nov. 17, 1976, Ser. No. 742,970

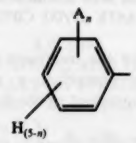
Int. Cl.[2] **C07D** *271/06;* **A01N** *9/36*

U.S. Cl. 424—200 **10 Claims**

1. A new compound of the formula



wherein R^1 and R^2 are independently selected from the group consisting of lower alkyl and



wherein A is selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio and halogen and *n* is an integer from 0 to 2; X^1, X^2, X^3, Z^1 and Z^2 are independently selected from the group consisting of oxygen and sulfur; *m* is the integer 0 or 1; and Y is selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio, amino, lower alkylamino and di (lower) alkylamino.

10. A method of controlling insects which comprises contacting said insects with an insecticidal composition comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to insects, a compound of claim **1**.

4,073,895

ISOPROPYLAMINO PYRIMIDINE ORTHOPHOSPHATE

André Esanu, Paris, France, assignor to Societe d'Etudes de Produits Chimiques, Paris, France

Filed Feb. 16, 1977, Ser. No. 769,403
Claims priority, application United Kingdom, Feb. 18, 1976, 06430/76
Int. Cl.[2] A61K *31/505;* C07D *239/42*
U.S. Cl. 424—200 2 Claims

1. The compound 2-isopropylamino pyrimidine orthophosphate.

2. A therapeutic composition of matter presenting a favourable action in the field of the nerve regeneration comprising an effective amount of 2-isopropylamino pyrimidine orthophosphate together with an appropriate carrier.

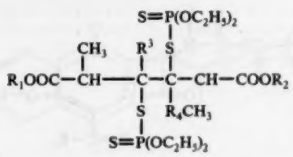
4,073,896

INSECTICIDE FROM DIMETHYLMUCONIC ACID

Richard D. Cassar, West Chester, Pa., assignor to Sun Ventures, Inc., Radnor, Pa.

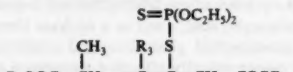
Division of Ser. No. 586,101, June 11, 1975. This application Sept. 20, 1976, Ser. No. 724,837
Int. Cl.[2] A01N *9/36;* C07F *9/02*
U.S. Cl. 424—205 7 Claims

1. A compound having the formula



wherein R_1 and R_2 are methyl, or ethyl, and may be the same or different, or one of R_1 and R_2 may be hydrogen, and R_3 and R_4 are methyl or hydrogen, and may be the same or different.

4. An insecticidal composition comprising a minor amount of an insecticidal compound having the formula



wherein R_1 and R_2 are methyl, or ethyl, and may be the same or different, or one of R_1 and R_2 may be hydrogen, and R_3 and R_4 are methyl or hydrogen, and may be the same or different, and a major amount of a suitable carrier.

4,073,897

TREATMENT OF ARTHRITIS AND ALLIED CONDITIONS WITH XENYLSALATE

Arthur Karler, Berkeley, Calif., assignor to Diagnostic Data, Inc., Mountain View, Calif.

Filed Nov. 15, 1976, Ser. No. 741,547
Int. Cl.[2] A61K *31/60*
U.S. Cl. 424—230 4 Claims

1. The method of treating arthritis and related conditions comprising administering systemically to an arthritic patient an effective amount of xenylsalate.

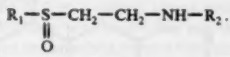
4,073,898

COMPOSITION FOR REDUCING THE OILY APPEARANCE OF THE HAIR AND SKIN

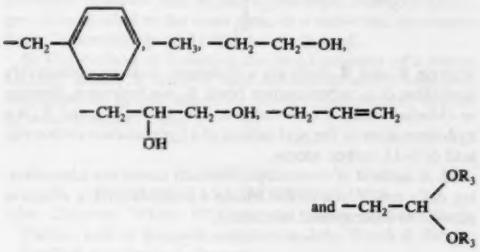
Claude Bouillon, Eaubonne, and Claudine Berrebi, Paris, both of France, assignors to L'Oreal, Paris, France

Filed Dec. 31, 1975, Ser. No. 645,658
Claims priority, application France, Dec. 31, 1974, 74 43406
Int. Cl.[2] A61K *31/615, 31/205;* C07C *147/14*
U.S. Cl. 424—233 17 Claims

1. A composition for treating oily hair or skin to reduce the oily appearance thereof comprising in an appropriate vehicle 0.1 to 10% by weight of an active compound having the formula:



wherein R_1 represents a member selected from the group consisting of:



wherein

R_3 is lower alkyl containing 1-3 carbon atoms;

R_2 is hydrogen and

HX represents an organic acid selected from the group consisting of tartaric acid, malic acid, glutamic acid, salicylic acid, fumaric acid and 5-amino-3-thia hexanedioic acid.

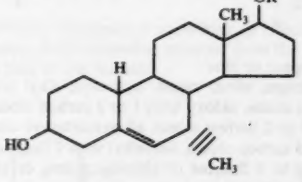
4,073,899

METHOD OF TERMINATING PREGNANCY

Joyce F. Grunwell, Hamilton, and John O. Johnston, Cincinnati, both of Ohio, assignors to Richardson-Merrell, Inc., Wilton, Conn.

Division of Ser. No. 506,255, Sept. 16, 1974, abandoned. This application Feb. 27, 1976, Ser. No. 661,967
Int. Cl.[2] A61K *31/565;* C07J *1/00*
U.S. Cl. 424—238 9 Claims

1. A method of terminating pregnancy in higher female primates which comprises administering to said primates a therapeutic amount of a 7α-methyl-estr-5-ene-3β,17β-diol having the formula



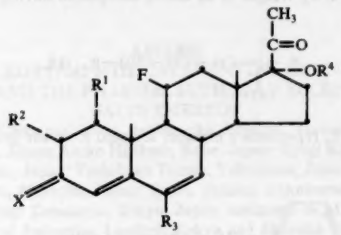
wherein R is selected from the group consisting of hydrogen and acyl having from 1 to 12 carbon atoms; administering said diol on or about 21 days following the onset of the last menstrual bleeding for a period of from 1 to 14 days or until menstrual bleeding again commences, whichever first occurs.

4,073,900
11β-FLUOROPREGNENES

Helmut Hofmeister; Henry Laurent; Rudolf Wiechert; Klaus Annen, and Hermann Steinbeck, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

Filed Oct. 19, 1976, Ser. No. 734,012
Claims priority, application Germany, Oct. 22, 1975, 2547687
Int. Cl.[2] C07J 7/00
U.S. Cl. 424—243 14 Claims

1. An 11β-fluoropregnene of the formula



wherein R_1 and R_2 each are a hydrogen atom or collectively methylene or a carbon-carbon bond; R_3 is a hydrogen, fluorine or chlorine atom; X is an oxygen atom or H,OR_4, and R_4 is a hydrogen atom or the acyl radical of a hydrocarbon carboxylic acid of 1–11 carbon atoms.

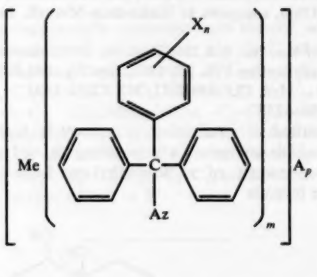
13. A method of contraception which comprises administering daily orally to a fertile female a contraceptively effective amount of a compound of claim 1.

4,073,901
METAL COMPLEXES OF N-TRITYL-AZOLES FOR COMBATTING FUNGI

Karl Heinz Buchel, Wuppertal; Paul-Ernst Frohberger, and Helmut Kaspers, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 14, 1976, Ser. No. 649,161
Claims priority, application Germany, Jan. 24, 1975, 2502932
Int. Cl.[2] A61K 31/555; C07F 1/08, 3/06
U.S. Cl. 424—245 10 Claims

1. A metal complex of an N-tritylazole of the formula



in which

Me is copper or zinc

X is halogen, nitro, cyano, hydroxyl, alkyl with up to 6 carbon atoms, akloxy with 1 or 2 carbon atoms, alkylthio with 1 or 2 carbon atoms, alkoxycarbonyl with a total of up to 5 carbon atoms, haloalkyl with 1 or 2 carbon atoms and up to 5 fluorine or chlorine atoms, or alkylsulfonyl with 1 or 2 carbon atoms,

Az is an imidazolyl radical or a 1,2,4-triazolyl radical,

A is a chloride, bromide, iodide, nitrate, sulfate or phosphate anion,

n is 0, 1, 2, 3 or 4,

m is 1, 2, 3 or 4, and

p is 1, 2, 3, 4, 5 or 6.

8. A fungicidal composition containing as active ingredient a fungicidally effective amount of a complex according to claim 1 in admixture with a diluent.

9. A method of combatting fungus pests which comprises applying to the pests or a habitat thereof a fungicidally effective amount of a complex according to claim 1.

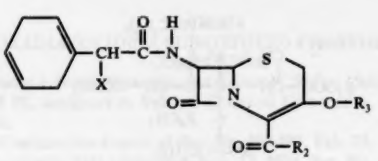
4,073,902
O-SUBSTITUTED 7β-AMINO-3-CEPHEM-3-OL-4-CARBOXYLIC ACID COMPOUNDS

Riccardo Scartazzini, Allschwil, and Hans Bickel, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 373,818, June 26, 1973, abandoned. This application Feb. 13, 1976, Ser. No. 657,908
Claims priority, application Switzerland, June 29, 1972, 9788/72; Aug. 17, 1972, 12195/72; Dec. 22, 1972, 18722/72; Feb. 23, 1973, 2655/73
Int. Cl.[2] A61K 31/38; C07D 501/16, 501/60
U.S. Cl. 424—246 18 Claims

1. An O-substituted 7β-amino-3-cepham-3-ol-carboxylic acid compound of the formula

(IA)



wherein X represents amino, R_2 represents hydroxyl or a group $R_2{}^A$ which together with the carbonyl grouping —C(=O)— forms a protected carboxyl group, and R_3 is lower alkyl, lower alkenyl, phenyl-lower alkyl, lower alkanoyl or lower alkoxycarbonyl, or pharmaceutically acceptable salts thereof.

5. A compound according to claim 1, which is the 7β-[D-α-amino-α-(1,4-cyclohexadienyl)-acetylamino]-3-methoxy-3-cephem-4-carboxylic acid, a salt or a hydrate thereof.

15. The antimicrobial pharmaceutical composition which comprises a therapeutically effective amount of a pharmacologically active compound of claim 1, together with a pharmaceutically usable excipient.

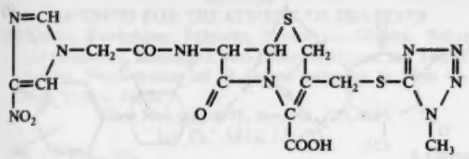
17. The method of treating infections caused by microorganisms which comprises administering the pharmaceutical composition of claim 15.

4,073,903
3-[5'(1-METHYLTETRAZOLYLTHIOMETHYL)]-7-[2(3''-NITROIMIDAZOLYL)ACETYL AMINO]CEPHALOSPORANIC ACID, SALTS, AND ITS PHARMACEUTICAL COMPOSITION

Silvia Zumin Tricerri, Carimate (Como), and Lino Chiarani, Milan, both of Italy, assignors to Pierrel S.p.A., Milan, Italy

Filed Sept. 27, 1976, Ser. No. 726,833
Claims priority, application United Kingdom, Oct. 1, 1975, 40063/75
Int. Cl.[2] A61K 31/545; C07D 501/36
U.S. Cl. 424—246 5 Claims

1. A cephalosporin compound of the formula



or non-toxic, pharmaceutically acceptable salts thereof.

5. A pharmaceutical composition comprising the antibacterial compound of claim 1 and a pharmaceutical carrier or excipient.

4,073,904
BIS-BASIC ETHERS OF 2,6,-AND 2,7-DIHYDROXY-ANTHRAQUINONES

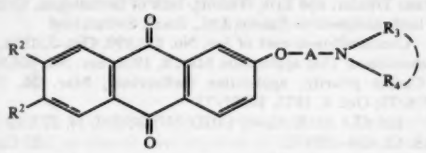
Robert W. Fleming; Arthur D. Sill, and Francis W. Sweet, all of Cincinnati, Ohio, assignors to Richardson-Merrell, Inc., Wilton, Conn.

Division of Ser. No. 394,584, Sept. 5, 1973, Pat. No. 3,974,186, which is a continuation of Ser. No. 37,312, May 14, 1970, abandoned. This application Jan. 26, 1976, Ser. No. 652,345

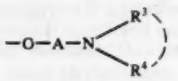
Int. Cl.[2] **C07D** *401/10, 403/10, 413/10;* **A61K** *31/445*

U.S. Cl. 424—248.58 **6 Claims**

1. A compound selected from a base of the formula



or a pharmaceutically acceptable acid addition salt of said base, wherein one R^2 is a hydrogen atom and the other R^2 is the radical



A is a straight chain alkylene group having 2 or 3 carbon atoms and R^3 and R^4 taken together with the nitrogen atoms to which they are attached is pyrrolidino, piperidino or morpholino.

6. A pharmaceutical preparation for administration to a host for resisting as well as suppressing viral infections comprising a pharmaceutical carrier and as the active ingredient an antivirally effective quantity of a compound of claim 1.

4,073,905
2-AMINO-4-PHENYL-2-IMIDAZOLINES AND SALTS THEREOF

Werner Kummer; Herbert Köppe; Helmut Stähle, all of Ingelheim am Rhein, and Walter Haarmann, Biberach an der Riss, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

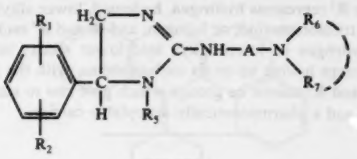
Continuation-in-part of Ser. No. 379,750, July 16, 1973. This application Mar. 9, 1977, Ser. No. 775,736

Claims priority, application Germany, July 19, 1972, 2235314; July 19, 1971, 2235328

Int. Cl.[2] **C07D** *403/12, 413/12;* **A61K** *31/495, 31/535*

U.S. Cl. 424—248.56 **8 Claims**

1. A compound of the formula



wherein

R_1 and R_2, which may be identical to or different from each other, are each hydrogen, chlorine, bromine or alkyl of 1 to 3 carbon atoms,

A is alkylene of 1 to 5 carbon atoms, and

R_6 and R_7, together with each other and the nitrogen atom to which they are attached, form a heterocycle selected from the group consisting of morpholino, piperazino or N'-dimethylphenyl-piperazino, and

R_5 is hydrogen, alkyl of 1 to 3 carbon atoms, hydroxyethyl, diethylamino-ethyl or furfuryl,

provided, however, that R_1 and R_2 are other than both hydrogen or both alkyl at the same time, or a non-toxic, pharmacologically acceptable acid addition salt thereof.

8. The method of lowering the blood pressure of a warm-blooded animal in need of such treatment, which comprises administering to said animal an effective hypotensive amount of a compound of claim 1.

4,073,906
PYRIMIDO[1,2,b]ISOQUINOLINES

Alan Chapman White, Windsor, and Robin Michael Black, Porton, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

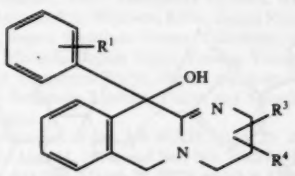
Filed Nov. 5, 1975, Ser. No. 629,205

Claims priority, application United Kingdom, Nov. 20, 1974, 50179/74

Int. Cl.[2] **A61K** *31/305;* **C07D** *239/70*

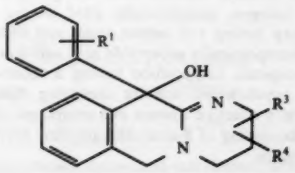
U.S. Cl. 424—251 **7 Claims**

1. A pyrimido[1,2-b] isoquinoline selected from the group consisting of a base of the formula



and a pharmaceutically acceptable acid addition salt thereof; wherein R^1 represents hydrogen, hydroxyl, lower alkyl, lower alkoxy, trifluoromethyl, or halogen; and R^3 and R^4 each represents hydrogen or lower alkyl; said lower alkoxy or lower alkyl groups having up to six carbon atoms, with the proviso that R^3 and R^4 cannot be groups which give rise to steric hindrance.

7. An anti-ulcer composition containing an effective amount of a pyrimido[1,2-b]isoquinoline selected from the group consisting of a base of the formula



and a pharmaceutically acceptable acid addition salt thereof; wherein R^1 represents hydrogen, hydroxyl, lower alkyl, lower alkoxy, trifluoromethyl, or halogen; and R^3 and R^4 each represents hydrogen or lower alkyl; said lower alkoxy or lower alkyl groups having up to six carbon atoms, with the proviso and R^3 and R^4 cannot be groups which give rise to steric hindrance, and a pharmaceutically acceptable carrier.

4,073,907
STABILIZED AMINOPHYLLINE SOLUTION AND PROCESS THEREFOR

David Thaddeus Guzek, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed June 1, 1976, Ser. No. 691,269
Int. Cl.[2] A61K *31/52*
U.S. Cl. 424—253 **7 Claims**

1. A method of stabilizing and preventing undesired crystal growth in an aqueous aminophylline solution for contact with a container system tending to promote crystal growth comprising: forming a solution of aminophylline, water, and disodium edetate, said disodium edetate present in the amount of about 0.01 to about 1.0% by weight based on the total solution weight, admixing ethylenediamine to effect a pH in the resulting solution of about 8.6 to about 9.0, said water prior to mixing with said aminophylline and disodium edetate being substantially free of carbon dioxide and excluding substantially all carbon dioxide from said solution by means of inert gas protection, said disodium edetate chelating any metal ion being present in said solution to form a soluble material.

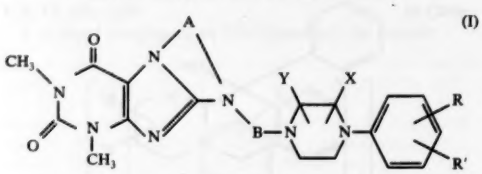
4,073,908
8-AMINO-THEOPHYLLINE DERIVATIVES AND APPLICATIONS THEREOF

Jean Raymond Quelet, Paris, France, assignor to Laboratoire le Brun S.A., Paris, France

Filed Mar. 10, 1976, Ser. No. 665,567
Claims priority, application France, Mar. 12, 1975, 75 07675
Int. Cl.[2] A61K *31/52*; C07D *473/08*
U.S. Cl. 424—253 **6 Claims**

1. A compound selected from the group consisting of the 8-amino-theophylline derivatives having the formula:

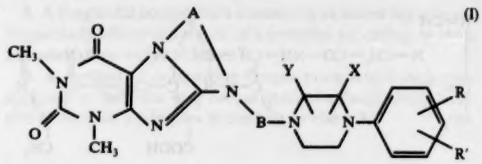
(I)



in which A is a member selected from the group consisting of straight- and branched-chain alkylene radicals having 2–4 carbon atoms in the alkylene portion; B is a member selected from the group consisting of straight- and branched-chain alkylene radicals having 2–6 carbon atoms in the alkylene portion; X and Y are members individually selected from the group consisting of hydrogen, straight-chain alkyl having 1–6 carbon atoms and phenoxy-alkylene having 1–6 carbon atoms in the alkylene moiety; R is a member selected from the group consisting of halogen, straight-chain alkyl having 1–6 carbon atoms, alkoxy having 1–6 carbon atoms and trifluoromethyl; and R′ is a member selected from the group consisting of hydrogen, halogen, straight-chain alkyl having 1–6 carbon atoms, alkoxy having 1–6 carbon atoms and trifluoromethyl; and their therapeutically acceptable acid addition salts.

5. A therapeutic composition having a sedative and anti-aggressive psychotropic activity consisting essentially of a therapeutically effective amount of a compound selected from the group consisting of 8-aminotheophylline derivatives having the formula:

(I)



in which A is a member selected from the group consisting of straight- and branched-chain alkylene radicals having 2–4 carbon atoms in the alkylene portion; B is a member selected from the group consisting of straight- and branched-chain alkylene radicals having 2–6 carbon atoms in the alkylene portion; X and Y are members individually selected from the group consisting of hydrogen, straight-chain alkyl having 1–6 carbon atoms and phenoxy-alkylene having 1–6 carbon atoms in the alkylene moiety; R is a member selected from the group consisting of halogen, straight-chain alkyl having 1–6 carbon atoms, alkoxy having 1–6 carbon atoms and trifluoromethyl; and R′ is a member selected from the group consisting of hydrogen, halogen, straight-chain alkyl having 1–6 carbon atoms, alkoxy having 1–6 carbon atoms and trifluoromethyl; and their therapeutically acceptable acid addition salts, together with a therapeutically acceptable vehicle.

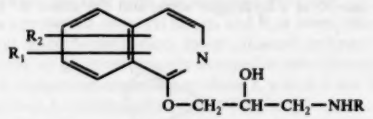
4,073,909
ISOQUINOLINE COMPOUNDS

Franz Troxler, and Erik Wiskott, both of Bottmingen, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 511,690, Oct. 3, 1974, abandoned. This application Mar. 8, 1976, Ser. No. 664,968
Claims priority, application Switzerland, Mar. 26, 1975, 3876/75; Oct. 8, 1973, 14307/73
Int. Cl.[2] A61K *31/47*; C07D *217/04, 215/14, 217/12*
U.S. Cl. 424—258 **52 Claims**

1. A compound of formula I,

I



wherein

R is lower alkyl or cycloalkyl of 3 to 7 carbon atoms; cycloalkyl of 3 to 7 carbon atoms substituted by alkyl of 1 to 4 carbon atoms; α-dialkylpropinyl or α-dialkylallyl of 5 to 9 carbon atoms, hydroxyalkyl of 2 to 7 carbon atoms, the hydroxy group thereof being separated by at least two carbon atoms from the nitrogen atom to which R is bound; phenethyl; phenethyl substituted by halogen, alkyl or alkoxy of 1 to 4 carbon atoms; ot adamantyl,

R_1 is hydrogen, halogen, alkyl or alkoxy of 1 to 4 carbon atoms, trifluoromethyl in the 5, 6 or 7 position, or a nitro or A—NH— group in the 4 or 5 position, wherein A is formyl or alkanoyl of 2 to 4 carbon atoms, and

R_2 is hydrogen, or, when R_1 is alkyl of 1 to 4 carbon atoms, also alkyl of 1 to 4 carbon atoms, or, when R_1 is alkoxy of 1 to 4 carbon atoms, also alkoxy of 1 to 4 carbon atoms, with the general proviso that the 8 position of the isoquinoline ring is unsubstituted, and any halogen substituent which may present in the 3 or 4 position is other than fluorine,

or a pharmaceutically acceptable acid addition salt thereof.

2. A method of treating hyperglycemia induced by stress in animals, which comprises administering to an animal in need of such treatment a therapeutically effective amount of a compound of claim 1.

4,073,910

METHOD FOR TREATMENT OF DIABETES

Hidetoshi Kawashima, Miyoshi; Shinzaburo Ohtake, Tokyo; Toru Fujimori, Kamakura; Isao Ohkawa, Hanno, and Tetsuya Tajima, Nagareyama, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Nov. 26, 1975, Ser. No. 635,448
Int. Cl.[2] A61K *31/455*
U.S. Cl. 424—266 6 Claims

1. A method for treatment of diabetes comprising administering, a therapeutically effective amount of Vitamine E nicotinate to a human suffering from diabetes.

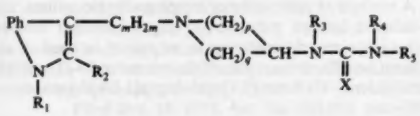
4,073,911

INDOLYLALKYLPIPERIDINES

Charles Ferdinand Huebner, Chatham, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 556,600, March 10, 1975. This application Feb. 2, 1976, Ser. No. 654,254
Int. Cl.[2] A61K *31/445;* C07D *401/14*
U.S. Cl. 424—267 9 Claims

1. A compound of the formula



wherein Ph is unsubstituted 1,2-phenylene or 1,2-phenylene substituted by one or two identical or different members selected from lower alkyl, hydroxy, mercapto, lower alkoxy, lower alkylenedioxy, benzyloxy, lower alkylmercapto, halogeno, trifluoromethyl, nitro and amino; each of R_1 and R_2 is hydrogen or lower alkyl; $(R_3 + R_4)$ is lower alkylene separating both nitrogens by 2 carbon atoms; R_5 is hydrogen, lower alkyl or phenyl unsubstituted or substituted in the positions 3 to 6 by one or two identical or different members selected from lower alkyl, hydroxy, mercapto, lower alkoxy, lower alkylenedioxy, benzyloxy, lower alkylmercapto, halogeno, trifluoromethyl, nitro and amino; X is oxygen, sulfur, imino or lower alkylimino; *m* is an integer from 1 to 7; each of *p* and *q* is an integer from 1 to 3, but $(p + q) = 4$; or a therapeutically acceptable acid addition salt thereof.

9. A method for reducing the blood pressure in mammals, which comprises administering to them enterally or parenterally an effective amount of a compound claimed in claim 1.

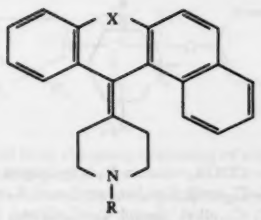
4,073,912

PIPERIDYLIDENE DERIVATIVES OF BENZO-FUSED XANTHENES, THIOXANTHENES AND DIBENZOXEPINS AND ANTIPSYCHOTIC USE THEREOF

Carl Kaiser, Haddon Heights, N.J., and John Joseph Lafferty, Levittown, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Oct. 12, 1976, Ser. No. 731,254
Int. Cl.[2] C07D *405/04, 409/04;* A61K *31/445*
U.S. Cl. 424—267 12 Claims

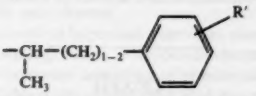
1. A chemical compound of the formula:



or a pharmaceutically acceptable acid addition salt thereof in which:

X is oxygen, sulfur or methyleneoxy; and

R is hydrogen, lower alkyl or alkenyl of from 1 to 5 carbon atoms, straight or branched chain, cycloalkylalkyl having 4 to 8 carbon atoms, hydroxyalkyl having from 2 to 4 carbon atoms, acyloxyethyl of from 2 to 7 carbon atoms or



R′ is hydrogen, benzyloxy, hydroxy, methoxy or 3,4-methylenedioxy.

9. A method of producing antipsychotic activity essentially free of extrapyramidal symptoms which comprises administering internally to an animal host in need of such activity a therapeutically effective amount of the compound of claim 1 or a nontoxic pharmaceutically acceptable acid addition salt thereof.

4,073,913

N^2-ARYLSULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Shosuke Okamoto, 15-1i, Asahigaoka 3-chome, Tarumi, Kobe, Hyogo, Japan; Akiko Hijikata, Kobe, Japan; Ryoji Kikumoto, Machida, Japan; Yoshikuni Tamao, Yokohama, Japan; Kazuo Ohkubo, Machida, Japan; Tohru Tezuka, Yokohama, Japan, and Shinji Tonomura, Tokyo, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo and Shosuke Okamoto, both of Japan

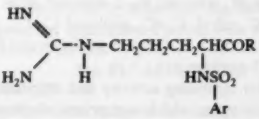
Continuation-in-part of Ser. No. 653,217, Jan. 28, 1976, and Ser. No. 713,486, Aug. 11, 1976, and Ser. No. 703,704, July 8, 1976, and Ser. No. 671,568, March 29, 1976, which is a division of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Jan. 19, 1977, Ser. No. 760,668

Claims priority, application Japan, Nov. 8, 1974, 49-128774; Nov. 8, 1974, 49-128775; Nov. 29, 1974, 49-136695; Nov. 29, 1974, 49-136697; Feb. 25, 1975, 50-23268; Feb. 26, 1975, 50-23635; Mar. 5, 1975, 50-26768; Mar. 11, 1975, 50-29357; Mar. 11, 1975, 50-29358

The portion of the term of this patent subsequent to Feb. 14, 1995, has been disclaimed.

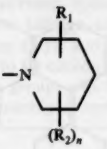
Int. Cl.[2] A61K *31/445;* C07D *211/60*
U.S. Cl. 424—267 5 Claims

1. An N^2-arylsulfonyl-L-argininamide having the formula (I):



(I)

or a pharmaceutically acceptable salt thereof, wherein R is



wherein R_1 is —$COOR_3$ wherein R_3 is hydrogen, C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7–C_{12} aralkyl or 5-indanyl; each R_2 independently is hydrogen, C_1–C_{10} alkyl, phenyl, C_1–C_5 alkoxy, C_2–C_6 alkoxycarbonyl or carboxy; n is an integer of 1 to 4, R_1 is substituted into the piperidine ring at the 2 or 3-position; and R_2 is substituted into the piperidine ring at the 2, 3, 4, 5 or 6-position; and Ar is 5, 6, 7, 8-tetrahydronaphthyl or naphthyl each of which is optionally substituted with at least one substituent selected from the group consisting of halo, hydroxy, nitro, cyano and C_1–C_{10} alkyl.

5. A method of inhibiting activity and suppressing activation of thrombin in vivo which comprises administering to a mammal a pharmaceutical effective amount of a compound of claim 1.

4,073,914

N²-NAPHTHALENESULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Ryoji Kikumoto, Machida; Yoshikuni Tamao, Yokohama; Kazuo Ohkubo, Machida; Tohru Tezuka, Yokohama; Shinji Tonomura, Tokyo; Shosuke Okamoto, and Akiko Hijikata, both of Kobe, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo and Shosuke Okamoto, Hyogo, both of Japan

Continuation-in-part of Ser. No. 671,568, March 29, 1976, which is a division of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Aug. 11, 1976, Ser. No. 713,486

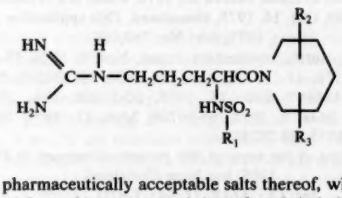
Claims priority, application Japan, Nov. 8, 1974, 49-128774; Nov. 8, 1974, 49-128775; Nov. 29, 1974, 49-136695; Nov. 29, 1974, 49-136697; Feb. 25, 1975, 50-23268; Feb. 26, 1975, 50-23635; Mar. 5, 1975, 50-26768; Mar. 11, 1975, 50-29357; Mar. 11, 1975, 50-29358

The portion of the term of this patent subsequent to Apr. 19, 1994, has been disclaimed.

Int. Cl.² A61K *31/445;* C07D *211/60, 211/62*

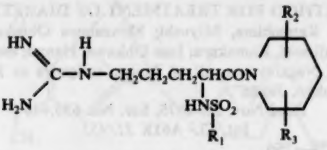
U.S. Cl. 424—267 **10 Claims**

1. An N^2-naphthalenesulfonyl-L-argininamide having the formula



and the pharmaceutically acceptable salts thereof, wherein R_1 is selected from the group consisting of naphthyl, 5,6,7,8-tetrahydronaphthyl and naphthyl substituted with at least one substituent selected from the group consisting of halo, nitro, cyano, hydroxy and C_1–C_{10} alkyl; R_2 is hydrogen or C_1–C_{10} alkyl; R_3 is —$COOR_4$ wherein R_4 is selected from the group consisting of C_1–C_{10} alkyl, C_6–C_{10} aryl and C_7–C_{12} aralkyl; R_2 can be substituted at the 2, 3, 4, 5 or 6-position; and R_3 is substituted at the 2 or 3-position.

10. A method for inhibiting activity and suppressing activation of thrombin in vivo, which comprises administering to a patient a pharmaceutically effective amount of an N^2-naphthalenesulfonyl-L-argininamide having the formula:



or the pharmaceutically acceptable salt thereof, wherein R_1 is selected from the group consisting of naphthyl, 5,6,7,8-tetrahydronaphthyl and naphthyl substitute with at least one substituent selected from the group consisting of halo, nitro, cyano, hydroxy and C_1–C_{10} alkyl; R_2 is hydrogen or C_1–C_{10} alkyl; R_3 is —$COOR_4$ wherein R_4 is selected from the group consisting of C_1–C_{10} alkyl, C_6–C_{10} aryl and C_7–C_{12} aralkyl; R_2 can be substituted at the 2, 3, 4, 5 or 6-position; and R_3 is substituted at the 2 or 3-position.

4,073,915

TREATING ASTHMA

Ulrich Martin, Birsfelden, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 686,172, May 13, 1976, abandoned. This application Mar. 3, 1977, Ser. No. 773,906

Claims priority, application Switzerland, May 20, 1975, 6475/75

Int. Cl.² A61K *31/445*

U.S. Cl. 424—267 **11 Claims**

1. A method of preventing or treating allergic asthma, exercise-induced asthma and allergic gastro-intestinal disorders which comprises administering to an animal in need of such treatment an effective amount of the compound 4-(1-methyl-4-piperidylidene)-4H-benzo[5,4]cycloheptа[1,2-b]thiophen-10(9H)-one.

4,073,916

N²-NAPHTHALENESULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Shosuke Okamoto, 15-1i, Asahigaoka 3-chome, Tarumi, Kobe, Hyogo, Japan; Akiko Hijikata, Kobe, Japan; Ryoji Kikumoto, Machida, Japan; Yoshikuni Tamao, Yokohama, Japan; Kazuo Ohkubo, Machida, Japan; Tohru Tezuka, Yokohama, Japan, and Shinji Tonomura, Tokyo, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo and Shosuke Okamoto, both of Japan

Continuation-in-part of Ser. No. 713,486, Aug. 11, 1976, which is a continuation-in-part of Ser. No. 671,568, March 29, 1976, Pat. No. 4,049,645, which is a continuation-in-part of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Jan. 19, 1977, Ser. No. 760,719

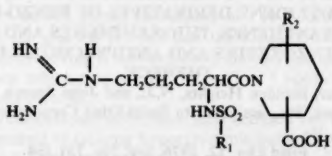
Claims priority, application Japan, Nov. 8, 1974, 49-128774; Nov. 8, 1974, 49-128775; Nov. 29, 1974, 49-136695; Nov. 29, 1974, 49-136697; Feb. 25, 1975, 50-023268; Feb. 26, 1975, 50-023635; Mar. 5, 1975, 50-026768; Mar. 5, 1975, 50-029357; Mar. 5, 1975, 50-029358

The portion of the term of this patent subsequent to Feb. 14, 1995, has been disclaimed.

Int. Cl.² A61K *31/445;* C07D *211/60*

U.S. Cl. 424—267 **17 Claims**

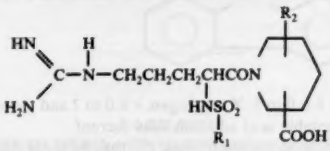
1. An N^2-naphthalenesulfonyl-L-argininamides having the formula



and the pharmaceutically acceptable salts thereof, wherein R_1 is selected from the group consisting of naphthyl, 5,6,7,8-tetrahydronaphthyl and naphthyl substituted with at least one

substituent selected from the group consisting of halo, nitro, cyano, hydroxy, C_1–C_{10} alkyl and C_2–C_{20} dialkylamino; R_2 is hydrogen or C_1–C_{10} alkyl; R_2 can be substituted at the 2, 3, 4, 5 or 6-position; and COOH is substituted at the 2 or 3-position.

17. A method for inhibiting activity and suppressing activation of thrombin in vivo, which comprises administering to a mammal a pharmaceutically effective amount of an N^2-naphthalenesulfonyl-L-argininamide having the formula:



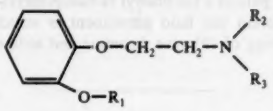
or the pharmaceutically acceptable salt thereof, wherein R_1 is selected from the group consisting of naphthyl, 5,6,7,8-tetrahydronaphthyl and naphthyl substituted with at least one substituent selected from the group consisting of halo, nitro, cyano, hydroxy, C_1–C_{10} alkyl and C_2–C_{20} dialkylamino; R_2 is hydrogen or C_1–C_{10} alkyl; R_2 can be substituted at the 2, 3, 4, 5 or 6 - position; and COOH is substituted at the 2 or 3 position.

4,073,917
LOCAL ANESTHETICS TERTIARY AMINOALKOXYPHENYL ETHERS

Rune Verner Sandberg, Jarna, and Sven Bengt Arvid Åkerman, Sodertalje, both of Sweden, assignors to Astra Lakemedel Aktiebolag, Sodertalje, Sweden

Filed Dec. 18, 1975, Ser. No. 641,984
Claims priority, application Sweden, Dec. 20, 1974, 7416143
Int. Cl.² A61K *31/445;* **C07C** *91/28;* **C07D** *295/08*
U.S. Cl. 424—267 **21 Claims**

1. A compound of the formula



and pharmaceutically acceptable acid addition salts thereof, in which formula R_1 represents an alkyl group selected from the group consisting of n-propyl, n-butyl and i-butyl, R_2 and R_3 are the same and are selected from the group consisting of ethyl and i-propyl.

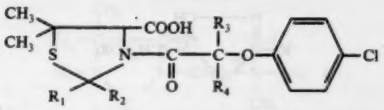
15. A method for producing local anesthesia, the method comprising administration to mammals, including humans, of a therapeutically effective amount of a compound according to claim 1.

4,073,918
PHENOXYALKYLCARBOXYLIC ACID AMIDES OF SUBSTITUTED THIAZOLIDINECARBOXYLIC ACIDS AND THEIR UTILIZATION IN MEDICAMENTS

Gunter Metz, Blaubeuren, and Manfred Specker, Ehigen, Donau, both of Germany, assignors to Ludwig Merckle KG, Blaubeuren, Germany

Filed Sept. 25, 1975, Ser. No. 616,890
Claims priority, application Germany, Sept. 26, 1974, 2446100
Int. Cl.² A61K *31/425;* **C07D** *277/06*
U.S. Cl. 424—270 **6 Claims**

1. A compound selected from the group consisting of phenoxyalkylcarboxylic acid amides of thiazolidinecarboxylic acid having the formula (I)

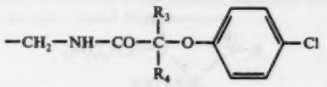


wherein

R_1 is selected from the group consisting of a hydrogen atom and a methyl group,

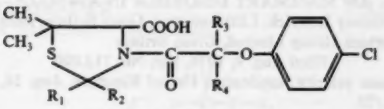
R_3 and R_4 are selected from the group consisting of a hydrogen atom and a methyl group,

R_2 is selected from the group consisting of a hydrogen atom, a methyl group and a group having the formula (II)



wherein R_3 and R_4 are as defined above, and the pharmaceutically acceptable salts thereof.

5. A pharmaceutical hypocholoesteremic composition comprising, as active ingredient, a hypocholesteremic compound selected from the group consisting of phenoxyalkylcarboxylic acid amides of thiazolidinecarboxylic acid having the formula (I)

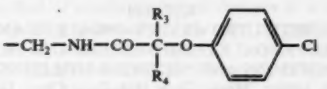


wherein

R_1 is selected from the group consisting of a hydrogen atom and a methyl group,

R_3 and R_4 are selected from the group consisting of a hydrogen atom and a methyl group,

R_2 is selected from the group consisting of a hydrogen atom, a methyl group and a group having the formula (II)



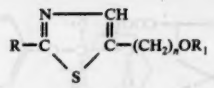
wherein R_3 and R_4 are as defined above, and the pharmaceutically acceptable salts thereof, in unit dosage forms for administering from 300–1500 mg/day, and a pharmaceutically acceptable carrier.

4,073,919
HYPOLIPEMIANT COMPOSITIONS AND METHODS

André Poittevin, Vaires-sur-Marne, and Vesperto Torelli, Maisons-Alfort, both of France, assignors to Roussel Uclaf, Paris, France

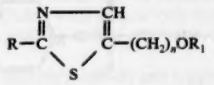
Filed Feb. 2, 1976, Ser. No. 654,629
Claims priority, application France, Feb. 14, 1975, 75 04627; Dec. 12, 1975, 75 38062
Int. Cl.² A61K *31/425*
U.S. Cl. 424—270 **6 Claims**

1. A hypolipemiant composition comprising an hypolipemiantly effective amount of at least one compound selected from the group consisting of a thiazole of the formula



wherein R is alkyl of 1 to 5 carbon atoms, *n* is an integer of 3,5 or 7 and R_1 is selected from the group consisting of hydrogen and acyl of an alkanoic acid of 2 to 6carbon atoms and their non-toxic, pharmaceutically acceptable acid addition salts and a pharmaceutical carrier.

3. A method of inducing hypolipemic activity in warm-blooded animals comprising administering to warm-blooded animals an hypolipemically effective amount of at least one compound selected from the group consisting of the formula



wherein R is alkyl of 1 to 5 carbon atoms, *n* is an integer of 3,5 or 7 R_1 is selected from the group consisting of hydrogen and acyl of an alkanoic acid of 2 to 6 carbon atoms and their non-toxic, pharmaceutically acceptable acid addition salts.

4,073,920

VETERINARY COMPOSITION FOR THE TREATMENT OF MAMMARY DISORDER IN ANIMALS

John Sidney Dowrick, Littlehampton, Great Britain, assignor to Beecham Group Limited, Great Britain

Filed Aug. 9, 1976, Ser. No. 712,890

Claims priority, application United Kingdom, Aug. 14, 1975, 33847/75

Int. Cl.[2] A61K *31/43, 47/00*

U.S. Cl. 424—271 **20 Claims**

1. A veterinary composition for intramammary administration to animals for the treatment of mammary disorders in animals comprising a suspension of an effective amount of a semi-synthetic penicillin in an oily vehicle, which oily vehicle comprises triglycerides, or propylene glycol di-esters, of fatty acids containing 8-10 carbon atoms.

4,073,921

SUBSTITUTED ARYLCYANOALKYL AND DIARYLCYANOALKYLIMIDAZOLES AND FUNGICAL COMPOSITIONS AND METHODS UTILIZING THEM

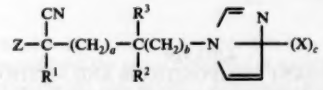
George A. Miller, Maple Glen; Hak-Foon Chan, Doylestown, and Harold E. Carley, Chalfont, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 557,546, March 12, 1975, abandoned. This application Jan. 7, 1976, Ser. No. 647,039

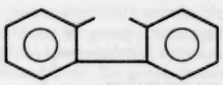
Int. Cl.[2] A01N *9/22;* **C07D** *233/56*

U.S. Cl. 424—273 R **13 Claims**

1. A compound of the formula



wherein Z is phenyl or phenyl substituted with up to three substituents independently selected from the group consisting of fluoro, chloro, bromo, iodo, nitro, cyano, methoxy, ethoxy, methyl, ethyl and trihalomethyl; R^1 is hydrogen, (C_1–C_{20}) alkyl, (C_3–C_8) cycloalkyl, (C_5–C_8) cycloalkenyl, (C_3–C_6) alkenyl, (C_3–C_6) alkynyl, phenyl, benzyl or phenethyl or phenyl, benzyl or phenethyl substituted with up to three substituents independently selected from the group consisting of fluoro, chloro, bromo, iodo, nitro, cyano, methoxy, ethoxy, methyl, ethyl and trihalomethyl; R^2 and R^3 are independently hydrogen, (C_1–C_{20}) alkyl, phenyl, benzyl or phenethyl or phenyl, benzyl or phenethyl substituted with up to three substituents independently selected from the group consisting of fluoro, chloro, bromo, iodo, nitro, cyano, methoxy, ethoxy, methyl, ethyl and trihalomethyl or R^2 and R^3 when taken together can form (C_4–C_8) cycloalkyl; R^1 and Z when taken together form the group



a is 0 to 5; *b* is 0 to 5; X is halogen; *c* is 0 to 2 and the agronomically acceptable acid addition salts thereof.

11. A method for controlling phytopathogenic fungi which comprises applying a fungicidally effective amount of a compound according to claim 1 to a plant, to plant seeds or to the plant habitat.

13. A fungicidal composition for controlling phytopathogenic fungi which comprises an agronomically acceptable carrier and, as the active ingredient a fungicidally effective amount of a compound of claim 1.

4,073,922

TREATMENT OF RHEUMATOID ARTHRITIS AND RELATED DISEASES

Roger Wyburn-Mason, Richmond Hill, England, assignor to John R. A. Simoons, Summit, N.J.

Filed June 29, 1976, Ser. No. 700,914

Claims priority, application Japan, Jan. 1, 1976, 51-684

Int. Cl.[2] A61K *31/415*

U.S. Cl. 424—273 R **5 Claims**

1. A method for producing remission in patients suffering from active rheumatoid arthritis which comprises administering to such a patient a bis-phenyl (2-halophenyl)-1-imidazolylmethane wherein the halo substituent is selected from the group consisting of chlorine, bromine and iodine.

4,073,923

FUNGICIDALLY EFFECTIVE IMIDAZOLES AND USE THEREOF AGAINST FUNGAL PESTS

Sugavanam Balasubramanyan, Wokingham; Margaret Claire Shephard, Maidenhead, and Patrick Jelf Crowley, Crowthorne, all of England, assignors to Imperial Chemical Industries Limited, London, England

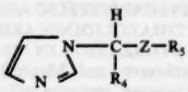
Filed Aug. 26, 1976, Ser. No. 718,206

Claims priority, application United Kingdom, Sept. 10, 1975, 37244/75

Int. Cl.[2] C07D *233/60;* **A01N** *9/22*

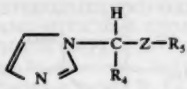
U.S. Cl. 424—273 R **9 Claims**

1. A compound of the formula (I):



wherein R_4 is ethyl or propyl, R_5 is hydroxy, $C_{1\text{-}14}$ alkoxy, phenylamino, benzyloxy or benzyloxy substituted with halogen and Z is C=O, or a fungicidal salt of said compound.

7. A method of combating fungal diseases in a plant, said method consisting essentially of the step of applying to the plant, or to the locus of the plant, a fungicidally effective amount of a compound of the formula:



wherein R_4 is C_{1-3} alkyl, R_5 is hydroxy, C_{1-14} alkoxy, phenylamino, benzyloxy or benzyloxy substituted with halogen and Z is C=O, or a fungicidal salts of said compound.

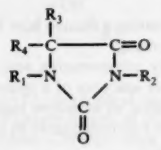
4,073,924

HYDANTOIN DERIVATIVES AND BROAD SPECTRUM BACTERICIDAL/FUNGICIDAL COMPOSITIONS THEREOF

Norman O. V. Sonntag, Montoursville, Pa., assignor to Glyco Chemicals, Inc., Greenwich, Conn.

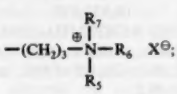
Filed Oct. 4, 1976, Ser. No. 729,344
Int. Cl.[2] A61K *31/415;* **C07D** *233/72*
U.S. Cl. 424—273 R **14 Claims**

1. A hydantoin derivative having the formula:



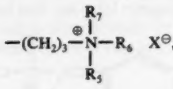
wherein:

when R_1 is $-C_nH_{2n}OH$, R_2 is



and

when R_1 is



R_2 is $-C_nH_{2n}OH$;

R_3 and R_4, which may be the same or different, are selected from the group consisting of hydrogen, alkyl of 1 to 6 carbons, phenyl or taken together R_3 and R_4 may be a cycloaliphatic group of 4 or 5 carbon atoms;

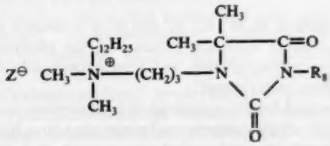
R_5, R_6 and R_7, which may be the same or different, are a group selected from the group consisting of benzyl or $-C_pH_{2p+1}$;

X is a physiologically accepted anion;

n is an integer from 1 to 4; and

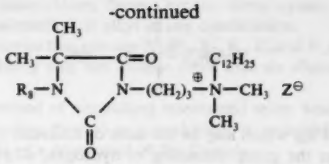
p is an integer from 1 to 24.

6. A compound according to claim 1 having the formula:



or

-continued



wherein:

R_8 is $-C_nH_{2n}OH$, Z is a physiologically acceptable anion and n is as defined.

9. A broad spectrum fungicidal and bactericidal compositon containing as an active ingredient a fungicidally and bactericidally effective amount of a compound according to claim 6, and a carrier for the active ingredient comprising an inert solid diluent or an inert liquid diluent.

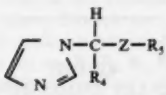
4,073,925

FUNGICIDALLY EFFECTIVE IMIDAZOLES AND USE THEREOF AGAINST FUNGAL PESTS

Sugavanam Balasubramanyan, Wokingham, and Margaret Claire Shephard, Maidenhead, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Aug. 26, 1976, Ser. No. 718,205
Claims priority, application United Kingdom, Dec. 12, 1975, 51039/75; Jan. 8, 1976, 671/76
Int. Cl.[2] C07D *233/60;* **A01N** *9/22*
U.S. Cl. 424—273 R **8 Claims**

1. A compound of the formula:



wherein R_4 is alkenyl or alkynyl each of up to 8 carbon atoms or aralkyl of up to 8 carbon atoms, said aralkyl being optionally substituted with halogen, alkyl of up to 8 carbon atoms, nitro, trifluoromethyl, cyano, methoxy or methylenedioxy, R_5 is cycloalkyl or branched chain alkyl of up to 8 carbon atoms, and Z is C = O, or a fungicidal salt of such compound.

7. A method of combating fungal diseases in a plant, said method consisting essentially of the step of applying to the plant, or to the locus of the plant, a fungicidally effective amount of a compound or salt as claimed in claim 1.

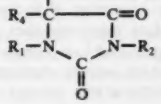
4,073,926

MONO-QUATERNARY AMMONIUM SALTS OF HYDANTOIN AND COMPOSITIONS THEREOF

Norman O. V. Sonntag, Montoursville, and John Douglas Freilich, S. Williamsport, both of Pa., assignors to Glyco Chemicals, Inc., Greenwich, Conn.

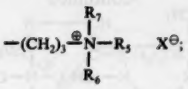
Filed Oct. 4, 1976, Ser. No. 729,343
Int. Cl.[2] A61K *31/415;* **C07D** *233/72*
U.S. Cl. 424—273 R **13 Claims**

1. A hydantoin derivative having the formula:



wherein:

one of R_1 and R_2 is hydrogen or alkyl of 1 to 6 carbon atoms and the other is



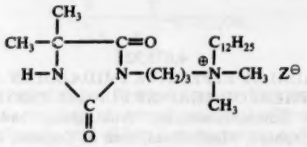
R_3 and R_4, which may be the same or different, are selected from the group consisting of hydrogen, alkyl of 1 to 6 carbons, phenyl or taken together R_3 and R_4 may be a cycloaliphatic group of 4 or 5 carbon atoms;

R_5, R_6 and R_7, which may be the same or different, are a group selected from the group consisting of benzyl or $-C_pH_{2p+1}$;

X is a physiologically acceptable anion;

p is an integer from 1 to 24.

6. A compound according to Claim 1 having the formula:



wherein Z is a physiologically acceptable anion.

8. A broad spectrum fungicidal and bactericidal composition containing as an active ingredient a fungicidally and bactericidally effective amount of a compound according to claim 6, and a carrier for the active ingredient comprising an inert solid diluent or an inert liquid diluent.

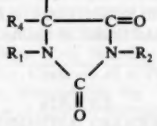
4,073,927

DI-QUATERNARY AMMONIUM SALTS OF HYDANTOIN AND COMPOSITIONS THEREOF

John Douglas Freilich, S. Williamsport, Pa., assignor to Glyco Chemicals, Inc., Greenwich, Conn.

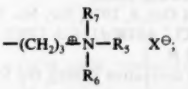
Filed Oct. 4, 1976, Ser. No. 729,342
Int. Cl.[2] A61K *31/415;* C07D *233/72*
U.S. Cl. 424—273 R 16 Claims

1. A hydatoin derivative having the formula:



wherein:

R_1 and R_2, which may be the same or different, are



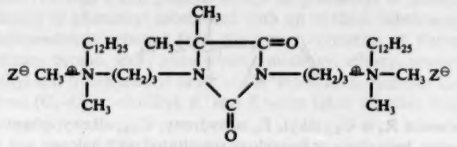
R_3 and R_4, which may be the same or different, are selected from the group consisting of hydrogen, alkyl of 1 to 6 carbons, phenyl or taken together R_3 and R_4 may be a cycloaliphatic group of 4 or 5 carbon atoms;

R_5, R_6 and R_7, which may be the same or different, are a group selected from the group consisting of benzyl or—C_pH_{2p+1};

X is a physiologically acceptable anion;

p is an integer from 1 to 24.

9. A compound according to claim 1 having the formula:



wherein Z is a physiologically acceptable anion.

11. A broad spectrum fungicidal and bactericidal composition containing as an active ingredient a fungicidally and bactericidally effective amount of a compound according to claim 9, and a carrier for the active ingredient comprising an inert solid diluent or an inert liquid diluent.

4,073,928

THERAPEUTIC TREATMENT FOR VIRAL REGIONAL ILEITIS INFECTION

James B. Mercer, 13109 W. 95th St., Lenexa, Kans. 66215

Continuation-in-part of Ser. No. 514,798, Oct. 15, 1974, Pat. No. 3,952,103. This application Feb. 9, 1976, Ser. No. 656,336
Int. Cl.[2] A61K *31/415*
U.S. Cl. 424—273 R 4 Claims

1. A method for treating a human host having viral regional ileitis infection comprising:

a. repeatedly orally administering anti-viral regional ileitis infection effective amounts of a pharmaceutical composition which contains, as an active ingredient, 1-(β-hydroxyethyl)-2-methyl-5-nitromidazole to a human host in need of said treatment.

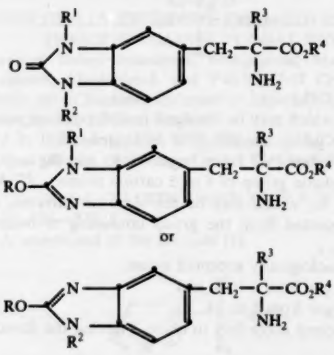
4,073,929

3-(2-SUBSTITUTED BENZIMIDAZOLYL) ALANINES

Patrick S. Callery, Cockeysville; Jeremy Wright, Baltimore, and Nicolas Zenker, Lutherville, all of Md., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 13, 1976, Ser. No. 657,829
Int. Cl.[2] A61K *31/415;* C07D *235/26*
U.S. Cl. 424—273 R 10 Claims

1. A compound of the formula



wherein each of R, R^1, R^2, R^3 and R^4 is hydrogen or alkyl of from 1 to about 3 carbon atoms, and the pharmaceutically acceptable carboxylic salts and pharmaceutically acceptable acid-addition salts thereof.

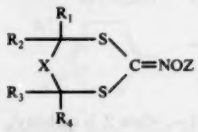
9. A method for the treatment of hypertension in a mammalian species which comprises administering to a hypertensive subject an effective amount of a compound of claim 1.

4,073,930
CARBAMOYLOXIMES AND OXIMES AND INSECTICIDAL AND MITICIDAL COMPOSITIONS AND METHODS EMPLOYING THEM

Arthur Peter Kurtz, Jr., Charleston, and Themistocles D. J. D'Silva, South Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed June 1, 1976, Ser. No. 691,374
Int. Cl.² A61K *31/385, 31/40, 31/445, 31/535*
U.S. Cl. 424—277 **43 Claims**

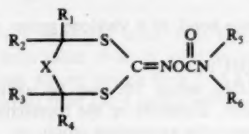
1. A compound of the formula:



wherein:
X is sulfur, sulfinyl or sulfonyl;
R_1, R_2, R_3 and R_4 are individually hydrogen or alkyl;
Z is hydrogen or

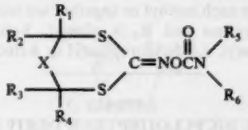
wherein:
R_5 is hydrogen, alkyl or cycloalkyl; and R_6 is:
A. phenyl either unsubstituted or substituted with one or more fluoro, chloro, bromo, nitro alkyl, cyano, trihalomethyl or alkoxy substituents; or
B. When R_5 is other than hydrogen, R_6 may also be alkylsulfenyl, cycloalkylsulfenyl, alkylthiosulfenyl, cycloalkylthiosulfenyl, naphthylsulfenyl, naphthylthiosulfenyl, trihalomethanesulfenyl, perhaloethanesulfenyl, dialkylaminosulfenyl, piperidylsulfenyl, pyrrolidylsulfenyl, morpholinosulfenyl, alkanoyl, haloalkanoyl or substituted or unsubstituted phenylsulfenyl or phenylthiosulfenyl wherein the permissible substituents are one or more fluoro, chloro, bromo, nitro, cyano, trihalomethyl, alkoxy or alkyl substituents;
with the proviso that no one R_1, R_2, R_3, R_4, R_5 and R_6 substituent individually includes more than six aliphatic carbons.

18. An insecticidal and miticidal composition comprising an acceptable carrier and an insecticidally or miticidally effective amount of a compound of the formula:



wherein:
X is sulfur, sulfinyl or sulfonyl;
R_1, R_2, R_3 and R_4 are individually hydrogen or alkyl;
R_5 is hydrogen, cycloalkyl or alkyl;
R_6 is:
A phenyl either unsubstituted or substituted with one or more chloro, bromo, fluoro, nitro, cyano, alkoxy, trihalomethyl or alkyl substituents; or
B. when R_5 is other than hydrogen R_6 may also be alkylsulfenyl, cycloalkylsulfenyl, cycloalkylthiosulfenyl, alkylthiosulfenyl, naphthylsulfenyl, naphthylthiosulfenyl, trihalomethanesulfenyl, perhaloethanesulfenyl, dialkylaminosulfenyl, iperidylsulfenyl, pyrrolidylsulfenyl, morpholinosulfenyl, alkanoyl haloalkanoyl or substituted or unsubstituted phenylsulfenyl or phenylthiosulfenyl wherein the permissible substituents are one or more chloro, fluoro, bromo, nitro, cyano, alkoxy, trihalomethyl or alkyl in any combination;
with the proviso that any one R_1, R_2, R_3, R_4, R_5 and R_6 substituent individually may not include more than six aliphatic carbons.

31. A method of controlling insects and mites which comprises subjecting them to an insecticidally or miticidally effective amount of a compound of the formula:



wherein:
X is sulfur, sulfinyl, or sulfonyl;
R_1, R_2, R_3 and R_4 are individually hydrogen or alkyl;
R_5 is hydrogen, cycloalkyl or alkyl;
R_6 is:
A. phenyl either unsubstituted or substituted with one or more chloro, bromo, fluoro, nitro, cyano, alkoxy, trihalomethyl or alkyl substituents; or
B. when R_5 is other than hydrogen R_6 may also be alkylsulfenyl, cycloalkylsulfenyl, cycloalkylthiosulfenyl, alkylthiosulfenyl, naphthylsulfenyl, naphthylthiosulfenyl, trihalomethanesulfenyl, perhaloethanesulfenyl, dialkylaminosulfenyl, piperidylsulfenyl, pyrrolidylsulfenyl, morpholinosulfenyl, haloalkanoyl alkanoyl or substituted or unsubstituted phenylsulfenyl or phenylthiosulfenyl wherein the permissible substituents are one or more chloro, fluoro, bromo, nitro, cyano, alkoxy trihalomethyl or alkyl in any combination;
with the proviso that any one R_1, R_2, R_3, R_4, R_5 and R_6 substituent may not individually include more than six aliphatic carbons.

4,073,931
NITROGLYCERINE INCLUSION COMPOUNDS WITH CYCLODEXTRIN AND COMPOSITION CONTAINING SAME

Eiichiro Akito, Omiya; Yoshiyuki Nakajima, Chiba, and Masayoshi Horioka, Fukuoka, all of Japan, assignors to Teijin Limited, Osaka and Nippon Kayaku Kabushiki Kaisha, Tokyo, both of, Japan

Filed Mar. 25, 1975, Ser. No. 561,884
Claims priority, application Japan, Mar. 27, 1974, 49-34176
Int. Cl.² A61K *9/20;* **C08B** *37/16*
U.S. Cl. 424—298 **5 Claims**

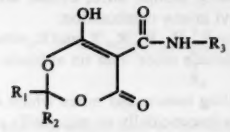
1. An inclusion compound of nitroglycerine in cyclodextrin.

4,073,932
METHOD OF CONTROLLING INSECTS USING 1,3-DIOXIN-4-ONES

Ernst Beriger, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 10, 1977, Ser. No. 757,810
Claims priority, application Switzerland, Jan. 14, 1976, 397/76; July 22, 1976, 9391/76; Dec. 14, 1976, 15701/76
Int. Cl.² A01N *9/28*
U.S. Cl. 424—279 **8 Claims**

1. A method of killing insects which comprises applying to said insects or the locus thereof an insecticidally effective amount of a compound of the formula



wherein

R_1 and R_2 are each methyl or together are tetramethylene or pentamethylene and R_3 is phenyl, 3-chlorophenyl, 4-chlorophenyl, 3,4-dichlorophenyl or 4-fluorophenyl.

4,073,933

NOVEL BICYCLOHEPTENE DERIVATIVES

Hiromi Shimomura, Nishinomiya; Akihiko Sugie, Takarazuka; Junki Katsube, Toyonaka, and Hisao Yamamoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

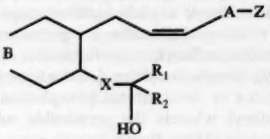
Filed June 17, 1976, Ser. No. 697,152

Claims priority, application Japan, June 27, 1975, 50-80292; July 1, 1975, 50-81635; July 1, 1975, 50-81636

Int. Cl.[2] C07C *177/00, 61/38, 69/74*

U.S. Cl. 424—299 **7 Claims**

1. A compound of the formula



wherein A is C_2–C_4 alkylene, B and X are each ethylene or vinylene, R_1 is hydrogen C_1–C_8 alkyl, C_4–C_8 alkyloxyalkyl, C_5–C_7 cycloalkyl, C_5–C_8 cycloalkylalkyl, R_2 is hydrogen or C_1–C_4 alkyl and Z is carboxyl or its non-toxic salt, or C_2–C_5 alkoxycarbonyl carbamoyl.

4,073,934

NOVEL ACETYLENIC PROSTAGLANDIN ANALOGS

Werner Skuballa; Bernd Radüechel; Helmut Vorbrueggen; Walter Elger; Olaf Loge, and Eckehard Schillinger, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

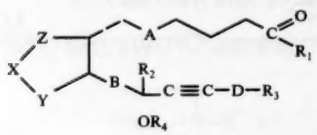
Filed Apr. 16, 1976, Ser. No. 677,861

Claims priority, application Germany, Apr. 18, 1975, 2517771

Int. Cl.[2] C07C *177/00;* **A61K** *31/215, 31/19*

U.S. Cl. 424—305 **82 Claims**

1. A (5Z, 13E) prostaglandin compound of the formula



wherein R_1 is $—OR_5$ or $—O—CH_2—U—V$, R_5 being a hydrogen atom, alkyl of 1–10 carbon atoms, phenyl, 1-naphthyl or 2-naphthyl, each of which can be substituted by up to 3 of halogen, phenyl, alkyl of 1–4 carbon atoms, chloromethyl, fluoromethyl, trifluoromethyl, carboxy, alkoxy and hydroxy or a heterocyclic ring of 5 or 6 ring members whose heteroatom is N, O or S, U being a direct bond, carbonyl or carbonyloxy, and V being phenyl substituted by one or more of phenyl, alkoxy of 1–2 carbon atoms, and halogen;

R_2 is hydrogen or alkyl of 1–5 carbon atoms;

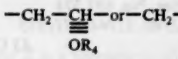
R_3 is alkyl or cycloalkyl of up to 10 carbon atoms;

A is cis-CH=CH—; B is trans-CH=CH;

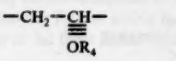
D is a direct bond, oxygen, or sulfur;

Z is carbonyl or $>CH—OR_4$ wherein OR_4 is in the α- or β-position and R_4 is H, tetrahydropyranyl, tetrahydrofuranyl, α-ethoxyethyl, trimethylsilyl, and tri-p-xylysilyl, alkanoyl of up to 7 carbon atoms or benzoyl; and

X Y is



when Z is $>CH—OR_4$—, or



or —CH=CH—, when Z is carbonyl;

and, when R_1 is hydroxy, physiologically acceptable salts thereof with bases.

4,073,935

SUBSTITUTED PROPANOL-(2)-DERIVATIVES AND THEIR NICOTINIC ACID ESTERS, AND PROCESS FOR THEIR PREPARATION, AND THE USE THEREOF AS HYPOLIPEMIC DRUGS

Helmut Grill, Vaterstetten; Rainer Hans Zschocke, Munich; Josef Wagner, Grunwald; Gernot Hofrichter, Vaterstetten, all of Germany, and P. Stefan Janiak, Basel, Switzerland, assignors to Klinge Pharma GmbH & Co., Germany

Filed Dec. 18, 1975, Ser. No. 641,982

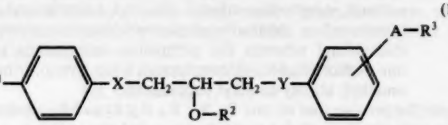
Claims priority, application Germany, Dec. 20, 1974, 2460689

Int. Cl.[2] A61K *31/235;* **C07C** *65/14, 69/76*

U.S. Cl. 424—308 **27 Claims**

1. A disubstituted propanol-(2) derivative of the general formula:

(I)



or its therapeutically acceptable salt, where X and Y stand for —O—;

R^1 = —Cl, or $—C(CH_3)_3$;

R^2 = —H;

A = a valence bond, or a vinylene group, or an ethylene group;

R^3 = —COOH, or

= —COOMe, where Me may be sodium, potassium, magnesium, aluminum or Me represents a therapeutically acceptable ammonium group, or

= —COOR‴, where R‴ is a straight or branched, saturated or unsaturated alkyl radical having 1 to 3 carbon atoms.

4,073,936

HYPOLIPIDEMIC ALLENE CARBOXYLIC ESTERS

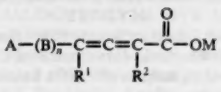
Eugene E. Galantay, Liestal, Switzerland, and Faizulla G. Kathawala, West Orange, N.J., assignors to Sandoz, Inc., East Hanover, N.J.

Division of Ser. No. 605,040, Aug. 15, 1975, Pat. No. 4,011,339. This application Nov. 17, 1976, Ser. No. 742,555

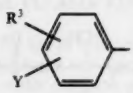
Int. Cl.[2] A61K *31/235;* **C07C** *149/40*

U.S. Cl. 424—308 **38 Claims**

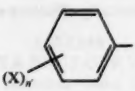
1. A compound of the formula



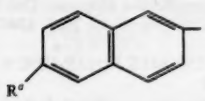
wherein
n is 0 or 1;
A is



wherein Y is a hydrogen atom, alkyl having from 1 to 4 carbon atoms, alkoxy having from 1 to 24 carbon atoms, alkylthio having from 1 to 24 carbon atoms, halo having an atomic weight of from about 19 to 36, cyclohexyl, phenoxy or substituted or unsubstituted phenyl of the formula



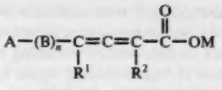
wherein X is a hydrogen atom, halo having an atomic weight of from about 19 to 36, alkoxy having from 1 to 4 carbon atoms or alkyl having from 1 to 4 carbon atoms; and
n' is 1 or 2;
each of R^1 and R^2, independently, is a hydrogen atom or alkyl having from 1 to 4 carbon atoms;
R^3 is a hydrogen atom, halo having an atomic weight of from about 19 to 36, or alkyl having from 1 to 4 carbon atoms; and
when *n* is 0, then A may also be



wherein R^a is a hydrogen atom, halo having an atomic weight of from about 19 to 36, alkyl having from 1 to 4 carbon atoms, alkoxy having from 1 to 4 carbon atoms, alkylthio having from 1 to 4 carbon atoms, or difluoromethoxy;
B is

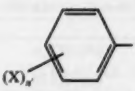
wherein each of R^4 and R^5 is, independently, alkyl having from 1 to 3 carbon atoms; and
M is alkyl having from 1 to 3 carbon atoms provided that when *n* is 0, then Y and R^3 are not both hydrogen atoms.

34. A pharmaceutical composition, useful as a hypolipidemic agent, comprising a non-toxic pharmaceutically acceptable solid carrier and as active ingredient from about 12.5 to 1000 milligrams of a compound of the formula

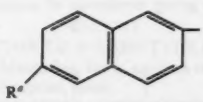


wherein
n is 0 or 1;
A is

wherein Y is a hydrogen atom, alkyl having from 1 to 4 carbon atoms, alkoxy having from 1 to 24 carbon atoms, alkylthio having from 1 to 24 carbon atoms, halo having an atomic weight of from about 19 to 36, cyclohexyl, phenoxy or substituted or unsubstituted phenyl of the formula



wherein X is a hydrogen atom, halo having an atomic weight of from about 19 to 36, alkoxy having from 1 to 4 carbon atoms or alkyl having from 1 to 4 carbon atoms;
n' is 1 or 2;
each of R^1 and R^2, independently, is a hydrogen atom or alkyl having from 1 to 4 carbon atoms;
R^3 is a hydrogen atom, halo having an atomic weight of from about 19 to 36, or alkyl having from 1 to 4 carbon atoms, and
when *n* is 0 then A may also be



wherein R^a is a hydrogen atom, halo having an atomic weight of from about 19 to 36, alkyl having from 1 to 4 carbon atoms, alkoxy having from 1 to 4 carbon atoms, alkylthio having from 1 to 4 carbon atoms, or difluoromethoxy;
B is

wherein each of R^4 and R^5 is, independently, alkyl having from 1 to 3 carbon atoms; and
M is alkyl having from 1 to 3 carbon atoms.

4,073,937

PREVENTIVE TREATMENT FOR OTITIS EXTERNAE

Jon Stephen Van Cleave, 812 SW. Lally St., Des Moines, Iowa 50315

Filed Aug. 12, 1976, Ser. No. 713,633
Int. Cl.[2] A61K *31/23, 31/16, 33/22, 31/19*
U.S. Cl. 424—312 **7 Claims**

1. A method of preventive treatment for swimmer's ear, and of combatting the uncomfortable feeling of water filling the ear, said method comprising,

applying to the skin surface of the external auditory canal prior to water contact with said skin surface, a pharmaceutically safe, liquid, non-ionic, substantially water insoluble, aqueous surface tension reducing agent the amount of said surface tension reducing agent being sufficient to substantially coat said skin surface

said aqueous surface tension reducing agent having a viscosity such that the agent can be conveniently administered as ear drops, but yet is not so thin that it will easily run out of the external auditory canal.

4,073,938
19,20-BIS-NOR-PROSTENOIC ACIDS AS HYPOLIPEMIC COMPOUNDS

Umberto Valcavi, Milan, Italy, assignor to Istituto Biochimico Italiano di Loredana Lorenzini S.a.s. and Dr. Madaus & Co., both of Milan, Italy

Filed July 30, 1975, Ser. No. 600,200
Claims priority, application Italy, Aug. 7, 1974, 26111/74
Int. Cl.[2] C07C *177/00;* A61K *31/215*
U.S. Cl. 424—317 **5 Claims**

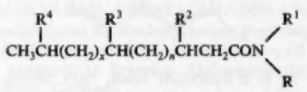
1. 9-hydroxy-19,20-bis-nor-prostanoic acid sodium salt.

4,073,939
CONTROL OF NEMATODES AND OTHER HELMINTHS EMPLOYING CERTAIN AMIDES

Malcolm J. Thompson, Baltimore; Julius Feldmesser, and William E. Robbins, both of Silver Spring, all of Md., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 631,259, Nov. 12, 1975, Pat. No. 4,036,987. This application Mar. 7, 1977, Ser. No. 775,228
Int. Cl.[2] A01N *9/20*
U.S. Cl. 424—320 **7 Claims**

1. A method of controlling nematodes comprising exposing said nemotodes to a lethally effective amount of a compound selected from the group consisting of compounds of the formula.



wherein R and R^1 are selected from group consisting of H, CH_3, and C_2H_5, and when x and n are each a number 3, each of R^2, R^3, and R^4 are selected individually from the group consisting of H and CH_3, and when x and n are not each a number 3 and the total of x and n is a number from 3 to 26, R^2, R^3, and R^4 are hydrogen.

4,073,940
METHOD FOR TREATING CARDIAC ARHYTHMIA BY ADMINISTRATION OF BASIC ARYLOXYACETAMIDE

Laurent Porte, Sanary-sur-Mer, France, assignor to Centre Europeen de Recherches Pharmacologiques C.E.R.P.H.A., Val-de-Marne, France

Filed Oct. 28, 1976, Ser. No. 736,522
Int. Cl.[2] A61K *31/165*
U.S. Cl. 424—324 **3 Claims**

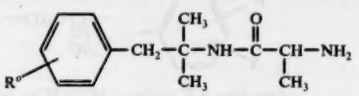
1. A method for treating a patient for cardiac arhythmia which comprises administering to the said patient N-(2,5-diethoxy phenyl)-N-(2-diethylamino ethyl)-4-butoxy phenoxy acetamide, or a pharmaceutically acceptable acid addition salt thereof, the mode of administration being oral or intravenous and the daily dosage being from 20 mg to about 500 mg of active ingredient.

4,073,941
ARALKYL AMIDES HAVING ANTIDEPRESSIVE ACTIVITY

Ulf Henrik Anders Lindberg; Svante Bertil Ross, both of Sodertalje; Seth Olov Thorberg, Jarna, and Sven Ove Ögren, Sodertalje, all of Sweden, assignors to Astra Lakemedel Aktiebolag, Sodertalje, Sweden

Filed Aug. 30, 1976, Ser. No. 718,570
Claims priority, application Sweden, Sept. 4, 1975, 75098137
Int. Cl.[2] A61K *31/165;* C07C *103/10, 103/32*
U.S. Cl. 424—324 **15 Claims**

1. A compound of the general formula



(I)

or a pharmaceutically acceptable acid addition salt thereof, in which formula the group R^o is selected from the group consisting of hydrogen, chlorine, bromine, methyl, trifluoromethyl and methoxy.

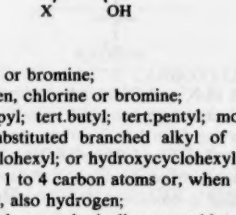
11. A method for the treatment of depressive disorders related to neuronal uptake of 5-hydroxytryptamine, the method comprising administration to a host in need of such treatment of a therapeutically effective amount of a compound as claimed in claim 1.

4,073,942
HALO-SUBSTITUTED HYDROXYBENZYL-AMINES AS SECRETOLYTIC AGENTS

Johannes Keck; Sigfrid Plischmann; Gerd Krüger, all of Biberach an der Riss; Klaus-Reinhold Noll, Warthausen-Oberhofen; Matyas Leitold, Biberach an der Riss, and Helmut Pieper, Mettenberg, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Continuation-in-part of Ser. No. 408,071, Oct. 19, 1973, abandoned, and Ser. No. 561,223, March 24, 1975, abandoned. This application Nov. 25, 1975, Ser. No. 635,220
Claims priority, application Germany, Oct. 23, 1972, 2251891; Apr. 26, 1973, 2320967; Sept. 17, 1973, 2346743; Apr. 3, 1974, 2416143
Int. Cl.[2] A61K *31/135;* C07C *87/29*
U.S. Cl. 424—330 **2 Claims**

1. A secretolytic pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective secretolytic amount of a compound of the formula



wherein

X is chlorine or bromine;

R_1 is hydrogen, chlorine or bromine;

R_2 is isopropyl; tert.butyl; tert.pentyl; mono-, di or trihydroxy-substituted branched alkyl of 3 to 5 carbon atoms; cyclohexyl; or hydroxycyclohexyl; and

R_3 is alkyl of 1 to 4 carbon atoms or, when R_2 is other than cyclohexyl, also hydrogen;

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

4,073,943

METHOD OF ENHANCING THE ADMINISTRATION OF PHARMALOGICALLY ACTIVE AGENTS

Karl Arvid Johannes Wretlind, Stockholm; Stellan Ljungberg, Lidingo; Ivan Hakansson, Huddinge, and Bengt Magnus Ajaxon, Uppsala, all of Sweden, assignors to Apoteksvarucentralen Vitrum AB, Stockholm, Sweden

Continuation-in-part of Ser. No. 504,880, Sept. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 88,474, Nov. 10, 1970, abandoned, which is a continuation-in-part of Ser. No. 754,738, Aug. 22, 1968, abandoned. This application Mar. 12, 1976, Ser. No. 666,264

Int. Cl.[2] A61K *47/00*

U.S. Cl. 424—358 1 Claim

1. A carrier system for use in enhancing parenteral administration of a pharmacologically active, oil-soluable agent, comprising a stable, oil-in-water emulsion containing a pharmacologically inert lipoid as a hydrophobic phase dispersed in a hydrophilic phase, said lipoid being dispersed in the emulsion as finely divided particles having a mean particle size less than 1 micron to achieve rapid onset of an acceptable therapeutic effect, said carrier system being used with an effective dose of said pharmacologically active, oil-soluble agent predominantly dissolved in said lipoid at a fraction ratio thereto in the hydrophobic phase, said therapeutic effect being attributable to said effective dose of the active agent.

4,073,944

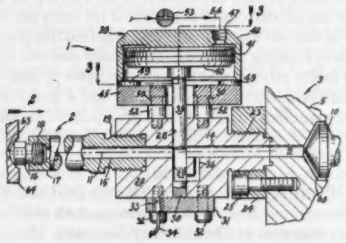
NOZZLE SHUT-OFF VALVE

James Earl Dawson, Lebanon, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed July 6, 1976, Ser. No. 702,481

Int. Cl.[2] B29F *1/03*

U.S. Cl. 425—146 12 Claims



1. A nozzle shut-off device for use in combination with and at a location between the nozzle and the plastication injection unit of a plastic injection molding machine, the nozzle having therethrough a substantially straight first passageway that is substantially coaxial with the exit passage from said plastication injection unit, said nozzle communicating with a mold cavity, which shut-off device comprises:

a body member for fixedly securing to and interposing between such nozzle and such injection unit and having therethrough a shut-off passageway that is substantially straight;

a lateral bore in said body intersecting said shut-off passageway, defining a pilot chamber on one side of said shut-off passageway and defining on the opposite side of said shut-off passageway a bore section in which the hereinafter said plunger is reciprocably supported;

a laterally extending plunger reciprocably mounted in said bore and of a cross-section to substantially completely block the following: said shut-off passageway when placed laterally thereacross, said lateral bore, and said pilot chamber, and having a length sufficient when advanced laterally fully to extend across said shut-off passageway into said pilot chamber thereby to block said shut-off passageway; and when fully withdrawn to substantially unblock said shut-off passage;

a pilot passage extending within said body between said pilot chamber and said shut-off passageway at a location that is upstream of the intersection of said bore with said shut-off passageway to establish communication between said upstream location and a region in said pilot chamber that is under the end of said plunger when the plunger is advanced into said pilot chamber sufficient to block said shut-off passageway.

4,073,945

FODDER FOR COWS

Heidrun Bertram, Hanau; Rudolf Fahnenstich, Mombris; Heribert Offermanns, and Herbert Tanner, both of Hanau, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Filed May 18, 1976, Ser. No. 687,503

Claims priority, application Germany, June 14, 1975, 2526750

Int. Cl.[2] A23K *1/00*

U.S. Cl. 426—2 17 Claims

1. The calcium salts of mono and bis hydroxymethyl derivatives of lysine.

4,073,946

PROCESS OF FEEDING LARVAL MARINE ANIMALS

Robert G. Bayless, Yellow Springs, Ohio, assignor to Capsulated Systems, Incorporated, Yellow Springs, Ohio

Division of Ser. No. 344,904, March 26, 1973, Pat. No. 3,922,373. This application Mar. 17, 1975, Ser. No. 558,835

Int. Cl.[2] A23K *1/18*

U.S. Cl. 426—2 3 Claims

1. The process of feeding larval marine animals, comprising the step of adding to the aqueous support system of the larval marine animals water-stable, substantially homogeneous, microglobules of hydrophilic, polymeric, cross-linked, film-forming material, having oil-insoluble nutrient material dispersed therein, and having a diameter of about 1 to 1000 microns.

4,073,947

PREPARATION OF A BEER-TYPE BEVERAGE

Paul R. Witt, Jr., Muscatine, Iowa, assignor to Grain Processing Corporation, Muscatine, Iowa

Continuation-in-part of Ser. No. 584,659, June 6, 1975, abandoned. This application Feb. 1, 1977, Ser. No. 764,567

Int. Cl.[2] C12C *9/00, 11/04;* C12G *3/00*

U.S. Cl. 426—13 6 Claims

1. A process for producing a non-distilled starch-based beer-type alcoholic beverage which comprises:

(a) subjecting liquefied starch derived from a source other than malt to hydrolysis with beta-amylase to produce a starch hydrolyzate containing fermentable carbohydrates and to produce a starch hydrolyzate having a dextrose equivalent value of from about 35 to 65 and a monosaccharide content of not more than about 10% by weight of carbohydrate content:

(b) preparing an aqueous liquid wort containing the said starch hydrolyzate in an amount from about 10 to 24% based on water content, a microbial, vegetable or animal protein hydrolyzate in an amount to provide about 0.10 to 0.50 milligram soluble nitrogen per milliliter having up to about 50% of the total as water soluble protein and up to 25% of the water soluble nitrogen as free alpha-amino nitrogen, a source of ammonium ions in an amount to provide about 0.10 to 0.50 milligram of nitrogen per milliliter, and a potassium phosphate salt in an amount to provide about 200 to 600 parts potassium per million and about 100 to 400 parts phosphorus per million, the maximum amount of malt in said liquid wort not exceeding about 2.5% by weight of starch;

(c) inoculating the liquid wort of step (b) with yeast; and

(d) fermenting for a period of not more than 8 days at a

temperature of from about 12 to 40° C. the liquid mass resulting from step (c) to produce a non-distilled starch-based beer-type alcoholic beverage.

4,073,948

PROCESS FOR PRODUCING MODIFIED PROTEIN

Keith L. Chandler, Algonquin; Roy G. Hyldon, Crystal Lake; Surinder Kumar, Buffalo Grove, and John P. O'Mahony, Crystal Lake, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed May 13, 1976, Ser. No. 685,734
Int. Cl.[2] A23J *3/00*
U.S. Cl. 426—44 **15 Claims**

1. A process for producing a modified plant protein having thermoplastic and forming properties similar to casein and caseinate slats, said process comprising:

a. making an aqueous slurry of a carbohydrate containing plant protein material containing at least about 30 percent by weight protein, said slurry having a solids content of from about 3 percent to about 18 percent by weight;

b. fermenting the slurry with a carbon dioxide generating yeast in a closed vessel to generate carbon dioxide, said fermentation being conducted at a temperature of from 33° F. to 90° F. for from 4 hours to 96 hours, and said yeast comprising a member selected from the group of yeast *Saccharomyces cerevisiae* and *Saccharomyces carlsbergensis;*

c. adding an alkali metal hydroxide or ammonium hydroxide to the slurry in amount sufficient to form a carbonate and to make a first pH adjustment of the carbonate containing slurry to a pH within the range from of about 7.0 to about 10.5;

d. heating the aqueous slurry to react the carbonate with the protein;

e. making a second pH adjustment to the slurry to produce a pH in the range of from 6.0 to 8.0 by addition thereto of an edible acid or edible alkali;

f. admixing the slurry with from about 0.3 percent to about 2.0 percent by weight peroxide per pound of protein in the slurry;

g. heating the slurry under a vacuum to a temperature within the range of from 60° F. to 150° F. to remove steam volatile flavor substances; and

h. drying the slurry until the moisture content thereof is less than 15 percent by weight.

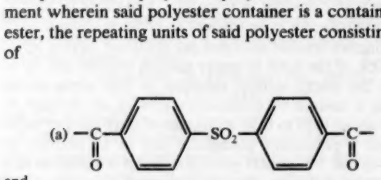
4,073,949

TEREPHTHALIC ACID/P,P-SULFONYLDIBENZOIC ACID/ETHYLENE GLYCOL/NEOPENTYL GLYCOL POLYESTER COMPOSITIONS AND CONTAINERS MADE THEREFROM

Santos W. Go, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 643,282, Dec. 22, 1975. This application Jan. 17, 1977, Ser. No. 759,973
Int. Cl.[2] B65D *81/00*
U.S. Cl. 426—106 **6 Claims**

1. In a method of packaging a product comprising placing said product in a polymeric polyester container, the improvement wherein said polyester container is a container of a polyester, the repeating units of said polyester consisting essentially of

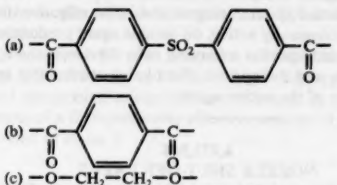


-continued

and (d) —O—CH_2—$C(CH_3)_2$—CH_2—O—,

said polyester having an oxygen permeability of less than 15 cc·mil/100 in.^{2}·day·atm. and a glass transition temperature in excess of 72° C., said (a) and (b) units and said (c) and (d) units respectively being the units formed by reactively combining polyester forming precursors thereof in an amount of at least one mole of the precursors of said (c) and (d) units per mole of precursors of said (a) and (b) units and wherein the precursors of said units in forming said polyester by said reactive combining are in a molar ratio of said (b) unit precursor to said (a) unit precursor of about 90:10 to about 40:60 and a molar ratio of said (c) unit precursor to said (d) unit precursor of about 80:20.

2. In a package comprising a polyester container and foodstuffs or medicines enclosed in said container, the improvement wherein said polyester container is a container formed of polyester, the repeating units of said polyester consisting essentially of



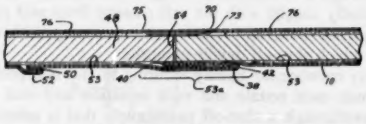
said polyester having an oxygen permeability of less than 15 cc·mil/100 in.^{2}·day·atm. and a glass transition temperature in excess of 72° C., said (a) and (b) units and said (c) and (d) units respectively being the units formed by reactively combining polyester forming precursors thereof in an amount of at least one mole of the precursors of said (c) and (d) units per mole of precursors of said (a) and (b) units and wherein the precursors of said units in forming said polyester by said reactive combining are in a molar ratio of said (b) unit precursor to said (a) unit precursor of about 90:10 to about 40:60 and a molar ratio of said (c) unit precursor to said (d) unit precursor of about 80:20.

4,073,950

EASY OPENING SPIRALLY WOUND DOUGH CAN

Eldon D. Hansen, and Douglas A. Edmonson, both of Minneapolis, Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed June 25, 1975, Ser. No. 590,366
Int. Cl.[2] B65D *85/36, 17/24*
U.S. Cl. 426—128 **15 Claims**



1. A dough container comprising a spirally wound body wall member formed from a paper base strip having its edges lying adjacent one another to define a spirally extending butt joint which produces a line of weakness along the length of the can, a liner formed from flexible sheet material adjacent to the interior of the body wall member, a label formed from flexible sheet material in strip form bonded to the exterior surface of the body member, the liner and label both extending spirally with respect to the axis of the can, the marginal edges of the label being offset circumferentially with respect to the butt joint between the adjacent edges of the spirally wound body member, the liner having an expandable helically extending pleat comprising at least three overlapping layers of material,

the side edges of the helical pleat comprising at least two parallel helically extending marginal lines substantially in alignment with and underlying the butt joint in the body stock and including means whereby when the label is removed the line of weakness in the container defined by the butt joint separates and the helical pleat expands thereby allowing the contents of the container under pressure to press the liner outwardly between the separated edges of the butt joint and cause the can to partially open as the side edges of the butt joint move apart owing to the outward expansion of the helical pleat and the liner ruptures along one or more of the fold lines of the helical pleat and the contents of the package can then be removed throughout substantially the entire length of the container between the torn edges of the liner.

4,073,951
AGGLOMERATION METHOD

Ralph G. Sargeant, 408 W. Windsor St., Lakeland, Fla. 33803

Continuation-in-part of Ser. No. 461,964, April 18, 1974, abandoned. This application Aug. 25, 1976, Ser. No. 717,662

Int. Cl.[2] A23L *2/22;* **A21D** *6/00*

U.S. Cl. 426—237 **15 Claims**

1. The method for agglomerating a finely divided particulate solid material which is capable of agglomerating by inter-particle adherence when the surfaces of the particles are moistened but which, though having a free native moisture content of at least 0.5% by weight, is dry in the sense of being free-flowing and having insufficient surface moisture to exhibit inter-particle adherence, comprising

introducing said particulate material into an agglomeration zone;

agitating the particulate material in the agglomeration zone to effect random particle-to-particle contact adequate to cause agglomeration when the particles have adequate surface moisture;

subjecting the particulate material, while being so agitated in the agglomeration zone, to electromagnetic radiation to heat the free native moisture within each particle, without substantial direct heating of the particle itself, and thereby causing free moisture from within the particle to appear in liquid state at the surface of the particle,

continuance of agitation then causing agglomeration to occur by inter-particle adherence though no moisture extraneous to the particulate material has been introduced into the agglomeration zone; and

recovering the agglomerated material as a product which contains less moisture than when introduced into the agglomeration zone and which does not require drying.

4,073,952
METHOD OF MAKING DEHYDRATED POTATO

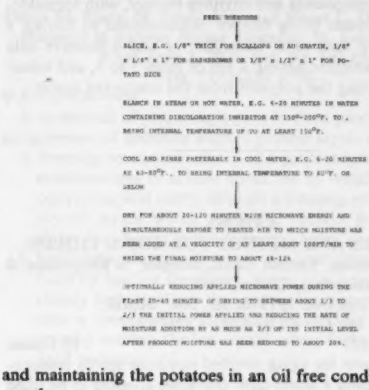
Charles N. Standing, and Hamilton A. Olabode, both of Minneapolis, Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed Aug. 2, 1976, Ser. No. 710,990

Int. Cl.[2] A23B *7/02, 7/06*

U.S. Cl. 426—242 **9 Claims**

1. A process for dehydrating potato pieces from the tuber of the potato *Solanum tuberosum* to form substantially oil free dried potatoes with the tissue cells together in the same relative relationship as during life, said process comprising peeling the potatoes, subdividing them into pieces having a thickness between about 1/16 and ¼inch, blanching the potatoes in steam or water for sufficient time to bring the internal temperature up to at least about 150° F. but without causing the complete cooking of the potatoes, cooling and rinsing the potatoes to bring the internal temperature thereof to about 80° F. or below, drying the potatoes with microwave energy and simultaneously exposing the potatoes in heated air at 75° F or above to which moisture has been added to bring the initial relative humidity to at least 83%, said heated air having motion relative to said potatoes and being supplied in sufficient quantity to bring the final moisture content of the potato to 12% or less


PEEL POTATOES
SLICE, E.G. 1/8" THICK FOR SCALLOPS OR AU GRATIN, 1/8" x 1/4" x 1" FOR HASHBROWNS OR 1/8" x 1/2" x 1" FOR POTATO DICE
BLANCH IN STEAM OR HOT WATER, E.G. 4-20 MINUTES IN WATER CONTAINING DISCOLORATION INHIBITOR AT 150°-200°F. TO BRING INTERNAL TEMPERATURE UP TO AT LEAST 150°F.
COOL AND RINSE PREFERABLY IN COOL WATER, E.G. 4-20 MINUTES AT 40-80°F., TO BRING INTERNAL TEMPERATURE TO 80°F. OR BELOW
DRY FOR ABOUT 20-120 MINUTES WITH MICROWAVE ENERGY AND SIMULTANEOUSLY EXPOSE TO HEATED AIR TO WHICH MOISTURE HAS BEEN ADDED AT A VELOCITY OF AT LEAST ABOUT 100FT/MIN TO BRING THE FINAL MOISTURE TO ABOUT 10-12%
OPTIONALLY REDUCING APPLIED MICROWAVE POWER DURING THE FIRST 20-40 MINUTES OF DRYING TO BETWEEN ABOUT 1/3 TO 2/3 THE INITIAL POWER APPLIED AND REDUCING THE RATE OF MOISTURE ADDITION BY AS MUCH AS 2/3 OF ITS INITIAL LEVEL AFTER PRODUCT MOISTURE HAS BEEN REDUCED TO ABOUT 30%.

and maintaining the potatoes in an oil free condition throughout the process.

4,073,953
METHOD FOR THE PRODUCTION OF ROLLED FOODS PRODUCTS

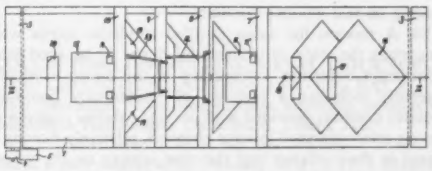
Erik Trostmann, Birkerod, and Ove Albertsen, Lyngby, both of Denmark, assignors to A/S Daloon, Nyborg, Denmark

Division of Ser. No. 588,319, June 19, 1975. This application Nov. 23, 1976, Ser. No. 744,270

Claims priority, application Denmark, June 24, 1974, 3381/74

Int. Cl.[2] A23P *1/00;* **A21D** *6/00*

U.S. Cl. 426—297 **7 Claims**



1. A method for producing rolled food products comprising the steps of

forming a flat edible wrap having a front portion and a rear portion and two opposite side portions,

depositing a filler centrally on the flat wrap,

successively folding the front portion and the opposite side portions of the wrap onto the filler substance by generating a pressure differential across the portions successively pressure above said portions being less that the pressure below said portions, and

rolling the folded wrap with its filler substance toward and onto a rear portion of the wrap thereby completing the enclosure of the filler.

4,073,954
METHOD OF REMOVING TANNINS AND REDUCING CLOUDING IN DRINKS

Christian Hermann Mobius, 23 Sudetenstr., Geisenheim, Germany (6222)

Filed Feb. 3, 1976, Ser. No. 654,920

Int. Cl.[2] C12H *1/04*

U.S. Cl. 426—330.3 **10 Claims**

1. A method of removing tannins from liquid fruit drinks, vegetable drinks, and fermented liquids of vegetable and fruit origin which comprises contacting the liquid with at least one highly dispersed polymer insoluble in the liquid and for a time sufficient to absorb the tannins and reduce clouding in the

liquid, the polymer being obtained by condensing a monomer selected from the group consisting of polyamino compounds, polyhydroxy compounds and mixtures thereof, with formaldehyde, said polymer being further characterized as having a specific surface area of at least $20m^2/g$ and a positive zeta potential in a solution having a pH of from 3 to 5, and subsequently separating the polymer from the contacted liquid.

4,073,955

APPARATUS AND METHOD FOR AGING LIQUOR

Edward Koppelman, Encino, Calif., assignor to Koppelman & Goodman Enterprises, Encino, Calif.

Filed Oct. 7, 1976, Ser. No. 730,618
Int. Cl.² C12G *3/00*; C12H *1/22*
U.S. Cl. 426—422 18 Claims

1. An apparatus for aging distilled alcoholic spirits comprising means defining a liquid-tight container adapted to be filled with the liquor to be aged, a manifold assembly mounted in said container and adapted to be at least partially submerged in the liquor, said manifold assembly comprising a framework incorporating a manifold including a plurality of substantially liquid-tight wooden conduits supported on said framework and having the interior channels thereof disposed in interconnected communication, at least a portion of the exterior surfaces of said wooden conduits provided with a charred coating thereover adapted to be disposed in contact with the liquor to be aged, a vapor recovery system connected to said manifold for receiving the vapors entering into said manifold assembly and effecting a recovery thereof, and means for producing relative movement between the liquor in said container and the char coating on said wooden conduits.

14. A process for aging distilled alcoholic spirits which comprises the steps of introducing liquor to be aged into a liquid-tight container, submerging in the liquor a manifold assembly including a plurality of substantially liquid-tight wooden conduits provided with charred exterior coatings and having interconnected interior channels, relatively moving the liquor in the container and the char coating on the wooden conduits, extracting and recovering the vapors entering the interior channels of said wooden conduits and continuing the aging treatment for a period of time sufficient to effect an improvement in the flavor of the distilled alcoholic spirits.

4,073,956

FOAM TEXTURIZATION OF FUNGAL MYCELIAL FIBERS

Richard Alan Yates, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 21, 1976, Ser. No. 734,630
Int. Cl.² A23B *1/00*
U.S. Cl. 426—470 9 Claims

1. A process comprising foaming an aqueous suspension of a fibrous proteinaceous hyphal fungal mass which contains from 10 to 35 weight percent solids, wherein the ribonucleic acid content of the fungal mass has been reduced to below 4 weight percent, and wherein at least 10% of the hyphae forming the fibrous proteinaceous hyphal mass are longer than about 0.5 mm to a density of from 2 to 8 milliliters of gas per gram of dry weight fungal mass to form a foamed slurry, filtering the foamed slurry to reduce the moisture content thereof to form a filtered foam, and drying the filtered foam to reduce the moisture content thereof to below 5 weight percent.

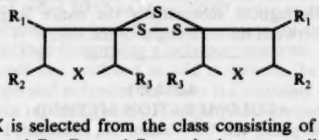
4,073,957

SPIRO-1,2,4-TRITHIOLAN CONTAINING FLAVORING AGENTS AND METHOD OF USE

Steven van den Bosch, Woudenberg, Netherlands, assignor to P.F.W. Beheer B.V., Amersfoot, Netherlands

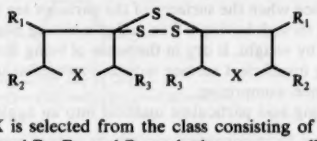
Filed May 12, 1976, Ser. No. 685,878
Claims priority, application United Kingdom, July 12, 1975, 29365/75
Int. Cl.² A23L *1/226, 1/231, 1/235*; C07D *341/00*
U.S. Cl. 426—535 20 Claims

1. A chemical compound having the structural formula



wherein X is selected from the class consisting of O, S, and $—CH_2—$, and R_1, R_2, and R_3 are hydrogen or alkyl groups having 1 to 3 carbon atoms.

16. A method of imparting flavor to or enhancing the flavor of a foodstuff which comprises incorporating therein an effective amount of a chemical compound having the formula



wherein X is selected from the class consisting of O, S, and $—CH_2—$, and R_1, R_2, and R_3 are hydrogen or an alkyl radical having 1 to 3 carbon atoms.

4,073,958

RICE FLAVORED SNACK FOOD

Shunji Abe, 1-banchi Oaza Tsuchikawa, Ojiya, Niigata, Japan

Filed Apr. 28, 1976, Ser. No. 681,203
Int. Cl.² A21D *10/00*
U.S. Cl. 426—559 19 Claims

1. A process for preparing a snack food which comprises:
a. homogeneously mixing finely divided corn material selected from the group consisting of waxy corn starch and waxy grits with a sufficent amount of finely divided rice bran having a particle size in the range of 100 to 300 mesh to impart a rice flavor and water,
b. kneading the mixture with steam for about 10 minutes at a pressure of 0.3 to 0.7 kg/cm^2 to produce a dough cake,
c. further kneading said dough cake in the absence of steam,
d. shaping said dough cake,
e. cooling said shaped dough cake,
f. drying said cooled dough cake for about 2 to 5 hours at about 40 to 50° C,
g. swelling said dried dough cake by baking or frying in oil at 150 to 300° C for 2 to 8 minutes, and
h. seasoning said swelled dough cake.

4,073,959

GUM CONFECTIONS CONTAINING POTATO STARCH

Harry Walter Durand, Muscatine, Iowa, assignor to Grain Processing Corporation, Muscatine, Iowa

Continuation-in-part of Ser. No. 639,381, Dec. 10, 1975, abandoned. This application Nov. 24, 1976, Ser. No. 744,501
Int. Cl.² A23G *3/00*
U.S. Cl. 426—578 2 Claims

1. In a continuous process for making a quick setting gum confection containing a starch gelling agent wherein the gum confection gels in a period of not substantially more than 2 hours, the improvement which consists in employing as the starch gelling agent potato starch having a Buel fluidity of about 20 to 70.

4,073,960

MEAT AND MILK PRODUCTS FROM RUMINANTS

Trevor William Scott, Kellyville, and Geoffrey Dean Loftus Hills, Beaumaris, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Division of Ser. No. 359,732, May 14, 1973, Pat. No. 3,925,560, which is a continuation-in-part of Ser. No. 100,332, Dec. 21, 1970, abandoned. This application Sept. 25, 1975, Ser. No. 616,882

Int. Cl.[2] A23C *9/00;* A23K *1/16*

U.S. Cl. 426—580 6 Claims

1. Improved nutritional products selected from ruminant milk and meat products whereby the unsaturated lipid content of body and milk fat of ruminant animals is increased, comprising:

feeding said ruminant animals a composite feed supplement material made of unsaturated dietary lipid which is assimilable by said ruminant animals and encapsulated by a reaction product of a dietary protein and an aldehyde which is substantially insoluble at a pH greater than about 5 and substantially soluble at a pH less than about 4 thereby not degradable in the rumen but subject to degradation in the abomasum and lower gut;

said unsaturated dietary lipid encapsulated within said reaction product being in the form of discrete globules having a size less than about 0.1 millimeter;

said feed supplement being fed in an effective amount to substantially increase the unsaturated lipid content of body and milk fat of said ruminant animals; and

allowing said feed supplement to be ingested by said ruminant animals and to pass through the rumen and become digested in the abomasum and lower gut of said ruminant animals to produce said improved nutritional products.

4,073,961

BOUILLON BASE

Rupert Josef Gasser, Zumikon, and Lienhard Bodo Huster, Winterthur, both of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle, S.A., Lausanne, Switzerland

Filed Aug. 13, 1976, Ser. No. 714,118

Claims priority, application Switzerland, Aug. 26, 1975, 11032/75

Int. Cl.[2] A23J *1/18;* A23L *1/28*

U.S. Cl. 426—589 7 Claims

1. A process for the production of a starting material for the preparation of bouillons from a yeast protein degradation product, which comprises diluting a yeast autolysate with at least the same quantity by weight of water, precipitating substantially insoluble salts, including alkaline-earth metal phosphates present therein, by heating the diluted autolysate which has a pH-value of from 7 to 8.5 at a temperature sufficient to cause said precipitating, separating solid fractions from the autolysate obtained by said prior heating step so that only a solution is left, subjecting the residual solution thus obtained to a steam stripping operation to purify the product of bitter flavor characteristics, concentrating the treated solution by evaporation to a dry matter content of from 50% to 80% by weight, mixing an effective amount up to 8% fats, an effective amount up to 5% of a monosaccharide, and an effective amount up to 2% of a nucleotide with the concentrated solution obtained, reacting the mixture obtained by heating the mixture having a pH-value of from 5.8 to 6.8 at a temperature sufficient to cause a reaction and drying said reacted mixture.

4,073,962

PROCESS FOR THE PRODUCTION OF A PROTEIN PRODUCT

James M. Spata, St. Louis, Mo., and Roger L. Diel, Dupo, Ill., assignors to Ralston Purina Company, St. Louis, Mo.

Filed June 1, 1976, Ser. No. 691,654

Int. Cl.[2] A23J *3/00*

U.S. Cl. 426—646 8 Claims

1. A method of preparing a protein food product having an arrangement of helically aligned protein layers comprising:

a. freezing an aqueous slurry of a protein material having a solids content of at least about 5% by weight by helically conveying said slurry through a freezing zone to form ice crystal layers which mold the protein material of the slurry into layers in the form of a helix, and

b. heat setting the protein layers into a substantially insoluble form by heating the frozen slurry to a temperature sufficiently high to allow the protein layers to set and lower than a temperature at which the protein will degrade thereby melting the ice crystal layers to form the protein food product.

4,073,963

STABLE, HOMOGENEOUS BUTTERED TABLE SYRUPS

Elmer E. Daggy, Tenafly, N.J., assignor to CPC International Inc., Englewood Cliffs, N.J.

Filed Dec. 27, 1976, Ser. No. 754,707

Int. Cl.[2] A23L *1/09*

U.S. Cl. 426—658 51 Claims

1. An emulsion system for a homogeneous, stable buttered table syrup having a sugar solids content of at least 65% Brix, said emulsion system consisting essentially of at least 0.1% by weight sodium stearoyl-2-lactylate; at least 0.2% by weight sorbitan monostearate; and, at least 1.6% by weight anhydrous butter oil or anhydrous butter fat.

4,073,964

PROCESS FOR CONTROLLING METAL THICKNESS, AND DEPOSITION AND DEGRADATION RATES

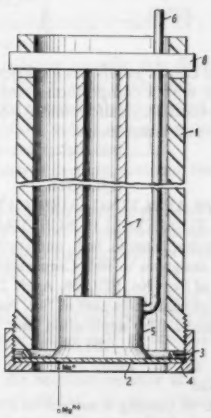
Gunther Herrmann, Nuremburg-Ebensee, Germany, assignor to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Mar. 3, 1975, Ser. No. 555,030

Claims priority, application Germany, Mar. 5, 1974, 2410927

Int. Cl.[2] G01N *23/203*

U.S. Cl. 427—10 26 Claims



1. A process for measuring metal layer thickness on an article during the formation or the degradation of said metal layer in a bath solution by means of a method selected from electroless, chemical, electrochemical and electrophoretic methods,

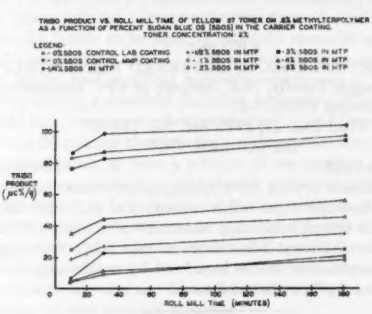
said process comprising mounting a test sample in an aperture in a liquid-tight casing in such a way that a part of said test sample faces outwards and is adapted to contact with a bath liquid when immersed therein and a second part faces the interior of said casing, immersing said test sample in a bath solution to be tested, and determining the radiation scattering capacity of a corresponding metallic layer deposited on or removed from said test sample while said test sample is present in said bath solution during the formation or degradation of said metal layer.

4,073,965

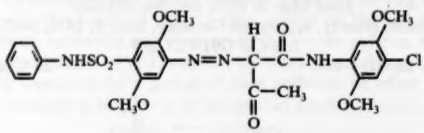
YELLOW DEVELOPER EMPLOYING A COATED CARRIER AND IMAGING PROCESS USING SAME

Joseph Mammino, Penfield, and Franklin Jossel, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sept. 29, 1975, Ser. No. 617,764
Int. Cl.[2] G03G *9/10, 13/01*
U.S. Cl. 427—22 14 Claims


TRIBO PRODUCT VS. ROLL MILL TIME OF YELLOW 87 TONER ON 45 METHYLTERPOLYMER (MTP) STEEL AS A FUNCTION OF PERCENT SUDAN BLUE OS (SBOS) IN THE CARRIER COATING. TONER CONCENTRATION 2%
LEGEND:
0 - 0% SBOS CONTROL LAB COATING
+ - 10% SBOS IN MTP
■ - 3% SBOS IN MTP
• - 0% SBOS CONTROL MAP COATING
0 - 1% SBOS IN MTP
Δ - 4% SBOS IN MTP
+ - 6% SBOS IN MTP
0 - 2% SBOS IN MTP
■ - 8% SBOS IN MTP
TRIBO PRODUCT (μC/g)
ROLL MILL TIME (MINUTES)

8. An electrostatographic imaging process comprising establishing an electrostatic latent image on a surface and contacting said surface with an electrostatographic developer comprising toner particles and coated carrier particles, said toner particles comprising a resin and a colorant satisfying the formula:



and said coated carrier comprises a carrier core particle material overcoated with a composition comprising a resin and a copper tetra-4-(octadecylsulfonomido) phthalocyanine colorant to develop said latent image.

4,073,966

METHOD FOR APPLYING LUBRICATING MATERIALS TO METALLIC SUBSTRATES

Addison B. Scholes, Muncie, Ind., and David L. Dollar, Greeneville, Tenn., assignors to Ball Corporation, Muncie, Ind.

Continuation of Ser. No. 570,346, April 22, 1975, abandoned, which is a continuation-in-part of Ser. No. 382,980, July 26, 1973, abandoned. This application Dec. 17, 1976, Ser. No. 751,691
Int. Cl.[2] B05D *1/06, 5/08, 7/14*
U.S. Cl. 427—26 20 Claims

1. A method of coating a surface of a metallic substrate to form a lubricious coating thereon, comprising:

forming a plurality of finely divided particles of lubricant, said particles having a diameter to weight ratio such that they will remain suspended in a substantially quiescent atmosphere;

physically transporting said suspended particles from the location of particle formation to the general location of said metallic substrate;

confining said suspended and transported particles in a non-electrically conductive housing adjacent the metallic substrate to be coated in a substantially quiescent atmosphere;

electrically charging said particles while so confined to the degree necessary to enable them to repel one another while they are suspended; and

electrostatically depositing said particles on the metal surface while said particles are in a repelling relationship with respect to one another by establishing an attracting electrical field between said confined charged particles and said metallic substrate whereby said particles are deposited on the substrate in a laterally displaced relationship with respect to one another.

4,073,967

METHOD FOR RENDERING SUBSTRATES RESISTANT TO ABRASION

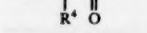
Timothy C. Sandvig, Woodville, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 513,116, Oct. 8, 1974, abandoned. This application Oct. 4, 1976, Ser. No. 728,951
Int. Cl.[2] B05D *3/06*
U.S. Cl. 427—44 48 Claims

1. A method for rendering a surface of a substrate resistant to abrasion comprising the steps of:

a. applying to said substrate, wherein said substrate is selected from metals and organic polymeric materials, a surface-coating of a composition comprising

i. a reactive silane of the formula $R'Si-R^2_{4-n}$, wherein R^1 is selected from the group consisting of $CH_2=CH-$, an alkyl group of from 2 to 10 carbon atoms containing an epoxy group, an alkyl ether epoxide group containing up t365- 10 carbon atoms, and



wherein R^3 is an alkylene group having from 1 to 8 carbon atoms, and R^4 is hydrogen or an alkyl radical having from 1 to 8 carbon atoms; R^2 is an alkoxy or acetoxy group; n is a positive integer of 1 to 3; and (ii) a metal ester of the formula $M—OR)_x$, wherein M is selected from the group consisting of titanium, aluminum, and zirconium; R is an alkyl radical having from 1 to 8 carbon atoms, and x is equal to the number of valence bonds of M; and

b. curing said composition so as to form an insoluble abrasion-resistant coating which is firmly bonded to the substrate.

4,073,968

METHOD FOR DESENSITIZATION OF A COLOR DEVELOPER

Akio Miyamoto; Hiroharu Matsukawa, and Teruo Kobayashi, all of Fujimiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 27, 1976, Ser. No. 736,048
Claims priority, application Japan, Oct. 27, 1975, 50-129098; Nov. 12, 1975, 50-136033; Nov. 18, 1975, 50-138419
Int. Cl.[2] B41M *3/12, 5/12*
U.S. Cl. 427—54 11 Claims

1. A method for desensitization of a color developer sheet to form a color by reaction with a color former which comprises coating a photocurable composition on the color developer and then irradiating the coated color developer with light to cure the photocurable composition prior to color formation.

4,073,969

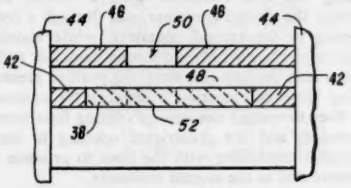
METHOD OF FABRICATING A PHOTOCONDUCTIVE DETECTOR OF INCREASED RESPONSIVITY

Billy H. Breazeale, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 553,346, Feb. 26, 1975, Pat. No. 3,963,925. This application Jan. 15, 1976, Ser. No. 649,189

Int. Cl.[2] B05D *5/12*

U.S. Cl. 427—75 6 Claims



1. A method of fabricating a photoconductive detector of increased responsivity from a slab of N-type, intrinsic bulk semiconductor material having a positive and negative contact spaced one from the other formed thereon and defining a photoconductive detector active area therebetween comprising the step of shielding part of the detector active area with a material limiting photon exposure of said active area to retain a reduced detector active area sufficiently spaced from the negative contact to permit negligible loss in responsivity due to recombination of the photogenerated hole carriers at the negative contact.

4,073,970

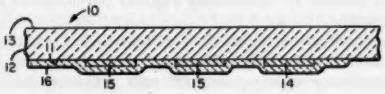
METHOD OF MAKING ELECTRIC HEATING UNIT

Richard E. Allen, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 623,419, Oct. 17, 1975. This application May 4, 1976, Ser. No. 683,005

Int. Cl.[2] H05B *3/16*

U.S. Cl. 427—96 1 Claim



1. The method of making an electrical resistance cooking or heating unit which comprises;

I. providing a flat and relatively smooth thin plate of a glassy material and selecting a portion thereof as a heating portion;

II. silk screening onto one surface of said selected heating portion of said plate a sinuous strip of a liquid mixture comprising an organic platinum paint mixed with an organic gold paint;

III. baking and firing said plate to burn away the organic material of said strip and form a fired platinum/gold alloy strip which is adhered to said plate and integral therewith;

IV. silk screening over said sinuous strip a slurry of a frit of a glassy material completely covering such strip, such frit having a composition, by weight, of about 20 parts of ZnO, about 25 parts of Al_2O_3, about 55 parts of SiO_2 and about 2 parts of Cs_2O; and

V. firing said plate and frit to provide a porous and partially sintered overglaze over said sinuous strip and part of the portion of said one surface to which such strip is adhered.

4,073,971

PROCESS OF MANUFACTURING TERMINALS OF A HEAT-PROOF METALLIC THIN FILM RESISTOR

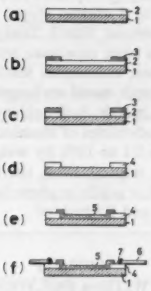
Nobuo Yasujima, 1-4, Noda, Kawagoe,, Saitama; Juichiro Arai, 1-5-3 Kaganchara,, Chiba-Matsudo; Natsuo Itokawa, 23 Kamitotsuka,, Fujioka, Gunma, and Katsumoto Okino, 125 Kuroda,, Mamba, Tano, Gumma, all of Japan

Continuation of Ser. No. 491,940, July 25, 1974, abandoned. This application June 2, 1976, Ser. No. 692,229

Claims priority, application Japan, July 31, 1973, 48-85436; July 10, 1974, 49-78849

Int. Cl.[2] B05D *5/12;* H01B *1/02;* H01C *17/28*

U.S. Cl. 427—103 8 Claims



1. A process of manufacturing terminals of a resistor consisting essentially of the steps:

(a) depositing a resistive metallic thin film heat proof between 300° and 800° C onto a substrate,

(b) chemical plating a metallic layer selected from the group consisting of nickel, cobalt and nickel-cobalt alloy onto terminal portions of said resistor of said resistive metallic thin film to make metallic terminal layers, and

(c) heat treating the resultant resistor at a temperature between 300° and 800° C in a non-oxidation atmosphere whereby said terminal layers which contact with said resistive metallic thin film reduce contact resistance therebetween to substantially zero and thereby produce an electrical current noise of the resultant resistor below −20(db).

7. A process of manufacturing terminals of a resistor consisting essentially of the steps:

(a) depositing a resistive metallic thin film heat proof between 300° and 800° C onto a substrate,

(b) chemical plating a metallic layer selected from the group consisting of nickel, cobalt and nickel-cobalt alloy onto said resistive metallic thin film,

(c) coating a resistive coating material onto the metallic layer,

(d) removing the resistive coating material except terminal portions of said resistor to expose said metallic layer,

(e) etching the exposed metallic layer to expose the resistive metallic thin film,

(f) removing the resistive coating material which has been coated onto said terminal portions of the resistor to expose the metallic layer which acts as terminal layers of said resistor, and

(g) heat treating the resultant resistor at a temperature between 300° and 800° C in an oxidation atmosphere whereby said terminal layers which contact with said resistive metallic thin film reduce contact resistance therebetween to substantially zero and thereby produce an electrical current noise of the resultant resistor below −20(db).

4,073,972

SURFACE PROTECTION FOR POROUS MATERIALS

Heinz Nestler, Niederkassel-Ranzel, and Leo Hans Plankl, Recklinghausen, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Cologne, Germany

Continuation of Ser. No. 354,606, April 26, 1973, abandoned. This application July 22, 1976, Ser. No. 707,930
Claims priority, application Germany, Apr. 26, 1972, 2220378
Int. Cl.[2] B05D *3/12, 1/36, 3/10*
U.S. Cl. 427—136 13 Claims

1. In a process for improving the water-repellancy of a porous surface of an object normally having an inorganic oxidic or hydroxyl containing surface which surface is neutral or acidic to phenolphthalein in which the surface is impregnated with a solution consisting essentially of an alkyltrialkoxysilane wherein the alkyl group has 1 to 6 carbon atoms and the alkoxy group has 1 to 8 carbon atoms dissolved in a C_2-C_4 alkanol, the improvement which comprises contacting the porous surface with a basic substance selected from the group consisting of limestone, calcareous marl, an alkali metal carbonate, an alkaline earth metal carbonate, alkali silicates, oxides of alkaline earth metals, hydroxides of alkaline earth metals, oxides of zinc, hydroxides of aluminum and sodium aluminate in the form of a 0.1 to 10% by weight solution or slurry before or during the impregnation, the basic substance being applied to the neutral or acidic to phenolphthalein surface in an amount between 0.5 and 50 gms/m^2.

4,073,973

CAVITY-FILLING WITH A POLY(ESTER-AMIDE) HOT MELT ADHESIVE COMPOSITION

Joseph G. Martins, Ludlow, and Donald D. Donermeyer, Springfield, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 2, 1976, Ser. No. 654,679
Int. Cl.[2] C08K *3/08*
U.S. Cl. 427—142 10 Claims

1. In a method of filling a cavity in a substrate which comprises applying excess adhesive compositions as a hot melt into the cavity, cooling the adhesive composition below its crystallization temperature, and sanding the adhesive composition to provide a surface even with the surrounding substrate, the improvement wherein the adhesive composition comprises:

a. from about 70 to about 30 parts by weight of a poly(ester-amide) block copolymer melting in the range of about 155° C. to about 225° C. having from about 30 to about 70 percent by weight of crystalline polyester segments derived from at least one aliphatic or alicyclic diol having 2 to 10 carbon atoms and at least one alicyclic or aromatic dicarboxylic acid having from 8 to 20 carbon atoms, and from about 70 to about 30 percent by weight of amorphous polyamide segments derived from an aliphatic polycarboxylic acid containing at least 40 weight percent of a C_{18} to C_{54} polycarboxylic acid and an aliphatic or alicyclic primary diamine containing 2 to 10 carbon atoms; and

b. from about 30 to about 70 parts by weight of a speroidal metal powder selected from the group consisting of aluminum, iron, mild steel, stainless steel and zinc of particle size in the range of about 0.2 to about 150 microns.

4,073,974

COATING CONTINUOUS FILAMENTS

Robert Vincent Albarino, Summit, and Sergio Torza, Madison, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 31, 1975, Ser. No. 600,280
Int. Cl.[2] B05D *1/18, 7/20*
U.S. Cl. 427—163 8 Claims

1. A method for coating a continuous fiber comprising:

passing the fiber into and out of a fluid filled container through upper and lower constricted openings with the fluid level of the coating within the container maintained between the upper and lower openings, while maintaining a reduced pressure within the container by evacuating the space above the coating fluid, the lower constricted opening restricting the flow of coating fluid from the container and the upper constricted opening allowing entry of the continuous fiber into the container while combining with the fiber to produce a partial pressure seal.

6. A method for coating a continuous fiber comprising:

passing the fiber in a vertical downward direction sequentially through a first container, through a constriction joining the first container with a second container, through the second container, and through a constricted opening in the second container, while maintaining a positive pressure within the second container and coating fluid within the first container, the positive pressure combining with the constriction between the containers and the fiber to restrict the flow of coating fluid between the containers and the constricted opening in the second container combining with the fiber to produce a partial pressure seal in the second container.

4,073,975

PROCESS FOR FLATTING GLOSSY SURFACES OF URETHANE POLYMERS

Mervin R. Buckwalter, Lancaster, and Edgar W. Knaub, Willow Street, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Sept. 17, 1976, Ser. No. 716,985
Int. Cl.[2] D06C *29/00;* B05D *5/00*
U.S. Cl. 427—170 7 Claims

1. A process for delustering a glossy polyurethane surface comprising:

(a) applying to a carrier member a coating of a solution of a curable polyurethane-forming composition in a diluent consisting of a solvent for said polyurethane-forming composition;

(b) treating the coated carrier member with vaporous water at a temperature of 70° to 200° F., said carrier member at a temperature of 60° to 150° F. and below the dew point of said vaporous water whereby a thin film of liquid water is deposited on the surface of said coatings;

(c) partially curing said coating having said thin film of water deposited thereon to a tack-free state; and

(d) completing the cure of said polyurethane-forming composition.

4,073,976

METHOD FOR CAPPING CELLULAR GLASS BLOCKS FOR THE LOAD BEARING INSULATION OF LIQUEFIED GAS STORAGE TANKS

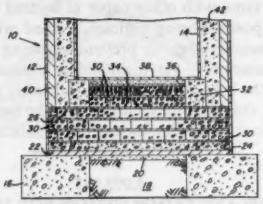
Stanley J. Dudzinski, Trafford, Pa., assignor to Pittsburgh Corning Corporation, Pittsburgh, Pa.

Division of Ser. No. 547,754, Feb. 6, 1975, Pat. No. 3,952,469.
This application Nov. 3, 1975, Ser. No. 628,144
Int. Cl.[2] B65D *25/18;* B05D *1/12, 7/22*
U.S. Cl. 427—181 15 Claims

1. A method for capping cellular glass blocks for use as load

bearing insulation of liquefied gas storage tanks consisting essentially of,

applying a layer of irreversably compressible inorganic particulate material to the surface of a layer formed from a plurality of cellular glass blocks each having a cut face forming a plurality of open hemispherical cells thereon, said plurality of cellular glass blocks forming a layer of said load bearing insulation,



penetrating said plurality of open hemispherical cells with said layer of inorganic particulate material to completely fill said open cells, and

compressing said layer of inorganic particulate material to form a substantially planar surface of said inorganic particulate material having a preselected thickness on said cellular glass block cut faces.

4,073,977

STABILIZATION OF PYROPHORIC METAL POWDERS WITH ALKYLENE OXIDE POLYMERS

Eberhard Koester, Frankenthal; Gerd Wunsch, Speyer; Eduard Schoenafinger, Ludwigshafen, and Hans Henning Schneehage, Mutterstadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed June 1, 1976, Ser. No. 691,227

Claims priority, application Germany, Aug. 7, 1975, 2535277

Int. Cl.² B05D *7/00;* **C04B** *31/40*

U.S. Cl. 427—216 **9 Claims**

1. A method of stabilizing a pyrophoric metal powder having particle sizes of from 50 to 2000A which comprises treating the metal powder with from 0.5 to 6g of gaseous alkylene oxide per gram of metal powder to form a polymer coating on the metal particles.

4,073,978

IMMERSION-TREATING TUBULAR ELEMENTS

William B. M. Womack; Ralph Emory Starnes, Jr., both of Carrollton, Ga.; John Charles Headrick, Oceola, Ark., and Ronald Ray Martin, Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.

Filed Nov. 12, 1976, Ser. No. 741,529

Int. Cl.² B05D *1/18, 1/38, 3/12*

U.S. Cl. 427—235 **33 Claims**

1. A method of continually treating the interior and exterior surfaces of tubular elements, comprising the steps of:

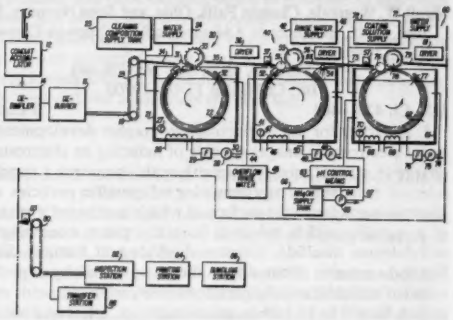
providing a first bath containing a cleaning agent, a second bath containing a rinsing agent, and a third bath containing a coating agent comprising an aqueous solution of a corrosion inhibitor and a film-forming polymer;

supplying a plurality of tubular elements comprising galvanized conduits of discrete length;

conveying said tubular elements in spaced, substantially parallel relation to each other about a first arcuate path through each bath in a first rotational direction for a predetermined immersion time;

conveying the tubular elements emerging from each bath about a second arcuate path disposed above each bath in a second rotational direction opposite to said first rotational direction; and

simultaneously inclining said tubular elements in said second arcuate path, the inclination of said tubular elements and the path traveled by said tubular elements about said second arcuate path being effective to drain excess agent from said tubular elements and into the bath associated



with said excess agent to thereby minimize the carry over of said agents between successive baths.

4,073,979

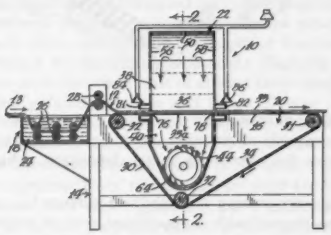
METHOD OF APPLYING MODIFYING INGREDIENTS TO OPEN-CELLED POLYURETHANE MATERIAL

Winslow L. Pettingell, Lombard, Ill., assignor to Foam Cutting Engineers, Inc., Addison, Ill.

Filed June 17, 1976, Ser. No. 697,065

Int. Cl.² B05D *5/00, 3/12*

U.S. Cl. 427—244 **11 Claims**



1. The method of applying a modifying ingredient to a mass of open-celled polyurethane foam, said method comprising the consecutive steps of:

applying an excess of a liquid solution or dispersion of said modifying ingredient to the mass of foam, said liquid being inert with respect to said foam;

squeezing the mass to remove most of said excess;

thereafter passing heated gaseous material entirely through the mass containing the remainder of said liquid solution or dispersion to rapidly raise the temperature of the entire mass, the temperature of said gaseous material being in the range of 350° F. to 500° F., said temperature being at least as high as the vaporization temperature of the liquid under the ambient condition of operation, the gaseous material being inert with respect to the polyurethane, the modifying ingredient and the liquid, and the period of exposure of the mass to the gaseous material being insufficient to allow charring of the foam, whereby the liquid is vaporized and the modifying ingredient is effectively simultaneously incorporated into the foam in a very short time;

and permitting the mass to cool.

4,073,980

CHEMICALLY TREATED CARRIER PARTICLES FOR USE IN ELECTROPHOTOGRAPHY

Virgil W. Westdale, Chagrin Falls, Ohio, and John Novotny, San Jose, Calif., assignors to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Sept. 29, 1976, Ser. No. 728,461
Int. Cl.[2] B32B *15/02, 19/00*
U.S. Cl. 428—404 8 Claims

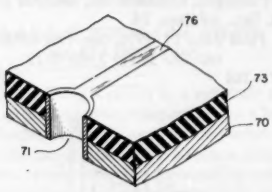
1. A carrier for use in electrophotographic development of latent electrostatic images capable of inducing an electrostatic charge in a toner mixed therewith with comprises a member selected from the group consisting of metallic particles and siliceous particles to the surface of which is adhered a mixture of a metallic sulfide selected from the group consisting of molybdenum disulfide, tungsten disulfide and titanium disulfide and a member selected from the group consisting of perfluorinated and substantially perfluorinated carboxylic acids containing from 3 to 18 carbon atoms and salts, esters and amides thereof, said sulfide and acid being present in a ratio by weight of sulfide to acid of about 0.2:1 to 5:1.

4,073,981

METHOD OF SELECTIVELY DEPOSITING METAL ON A SURFACE

William James Baron, Franklin Township, Somerset County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Mar. 11, 1977, Ser. No. 776,814
Int. Cl.[2] B05D *3/10, 5/12*
U.S. Cl. 427—259 17 Claims



1. A method of selectively depositing a metal on a surface of a substrate capable of retaining thereon a colloidal activating metal species for electroless metal deposition, which comprises:

(a) selectively coating the substrate surface by coating a portion thereof with a copolymer coat of maleic anhydride and a vinyl monomer, said coat being selectively incapable of retaining thereon said colloidal activating metal species, to delineate an uncoated surface pattern capable of retaining the colloidal activating metal species thereon; and thereafter

(b) treating said selectively coated surface with a sol comprising said colloidal activating metal species to deposit said colloidal activating metal species only on said uncoated surface pattern.

4,073,982

NEWSPRINT COUPON SEPARATOR

Friedrich J. Weck, 1339 S. Seventh Ave., Hacienda Heights, Calif. 91745; James Hunkins, 13001 Aclare Place, Cerritos, Calif. 90701, and Samuel J. Rinsler, 712 N. Kings Road, Los Angeles, Calif. 90069

Filed July 18, 1975, Ser. No. 596,999
Int. Cl.[2] B05D *3/10;* B41M *7/00;* B32B *29/06*
U.S. Cl. 427—270 7 Claims

1. A method of printing paper, integral portions of which are readily hand-detachable from the remainder of the paper along predetermined boundaries, which method comprises:

supplying to a printing press a paper-weakening composition comprising a pigment and a vehicle including substantially non-corrosive humectant, water and a wetting agent;

passing a web of paper through the printing press;

repetitively demarking discrete portions of the paper from surrounding portions thereof with said composition while maintaining the integrity of the web across resulting lines of demarcation; and

removing the paper from the press and forming an assembly of the same with other paper in layered relation;

said composition being sufficiently dried prior to the foregoing assembly step to prevent smearing of the pigment upon assembly, yet maintaining a moistened condition along the lines of demarcation following the assembly step so that the paper may subsequently be easily and preferentially torn along the lines of demarcation.

4,073,983

METHOD AND COMPOSITION FOR DECREASING WATER RESISTANCE TO MOVEMENT

Jon Stephen Van Cleave, Des Moines, Iowa, assignor to United Chemical Corporation, Des Moines, Iowa

Filed Apr. 25, 1975, Ser. No. 571,610
Int. Cl.[2] B05D *1/02*
U.S. Cl. 427—421 15 Claims

1. A method of decreasing water resistance to movement by decreasing the surface tension and the contact angle between an object moving in water, and the water, thereby allowing the object to move at an increased speed with the same applied moving force or at the usual speed with less applied moving force, said method comprising, applying to the surface of the object, a coating consisting essentially of a non-ionic surface active agent or mixtures thereof selected from the group consisting of sorbitan fatty acid esters, polyoxyethylene sorbitol esters, polyoxyethylene alcohol ethers, polyoxyethylene mannitol dioleate esters, and sorbitan monoleate polyoxyethylene esters of mixed fatty and resin acids, which is water insoluble, said agent having an HLB of from about 7 to about 9, and moving said object through water thereby providing a solid liquid interface.

4,073,984

METHOD FOR IMPARTING A LUSTROUS TOP SURFACE TO ARTIFICIAL LEATHER

Kenji Okabe, Osaka, Japan, assignor to Toyo Cloth Co., Ltd., Osaka, Japan

Filed Apr. 19, 1976, Ser. No. 678,178
Claims priority, application Japan, Oct. 3, 1975, 50-119641
Int. Cl.[2] B05D *3/12, 7/04*
U.S. Cl. 427—444 7 Claims

1. A process for imparting lustre to the top surface of an artificial leather comprising a laminate of a substrate, a cellular foam thermoplastic resin and a top coating of a thermoplastic resin having a softening point lower than that of said cellular foam, which process comprises:

contacting the surface of said top coating with a smooth surface at a temperature of 10°–40° C below the softening point thereof for about 3–40 seconds while avoiding static friction between the top coating and said smooth surfact at a pressure insufficient to rupture the cells of said foam to substantially increase the degree of lustre of said top coating.

4,073,985

COMPOSITE DOME

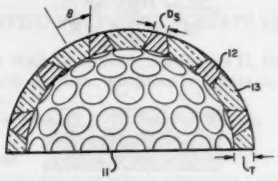
Anthony San Miguel, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 14, 1976, Ser. No. 705,223
Int. Cl.[2] F42B *15/02*
U.S. Cl. 428—35 9 Claims

1. A transparent shell, having a concave and convex surface,

for protecting energy responsive instrumentation in a missile, said shell comprising:

a plurality of discrete, wedge-shaped, transparent optical elements having their smaller ends flush with said concave surface and their larger ends flush with said convex surface, said elements arranged adjacently so as to have interstices therebetween to form a dome; and



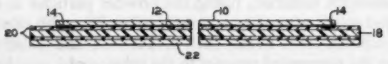
a continuous high temperature resistant polymer matrix positioned in the interstices between said discrete, wedge-shaped, transparent optical elements, and rigidly holding said discrete, wedge-shaped, transparent optical elements in place.

4,073,986

LAMINATED GLAZING UNIT WITH COMPOSITE INTERLAYER

Leroy D. Keslar, Natrona Heights, and James E. Vensel, New Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 14, 1975, Ser. No. 577,248
Int. Cl.² B32B *17/10, 27/40, 27/42*
U.S. Cl. 428—38 **14 Claims**



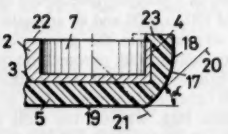
1. A laminated glazing unit comprising an outer sheet of transparent rigid material, an inner sheet of transparent rigid material, at least one of said sheets being a glass sheet likely to be damaged by cold chipping in service, an interlayer having a plasticized polyvinyl butyral surface integral with said glass sheet, and a continuous layer of transparent polyurethane disposed between said glass sheet and said plasticized polyvinyl butyral interlayer and integral therewith throughout substantially the entire extend common to said glass sheet and said interlayer.

4,073,987

MULTI-LAYER FRONT PLATE FOR FURNITURE AND METHOD OF MAKING SAME

Dietrich Mergner, Magstadt, and Heinz Stege, Stuttgart, both of Germany, assignors to Bauknecht Gesellschaft mit beschrankter Haftung Elektrotechnische Fabriken, Stuttgart, Germany

Filed Oct. 7, 1975, Ser. No. 620,390
Claims priority, application Germany, Oct. 8, 1974, 2447873
Int. Cl.² B32B *3/26*
U.S. Cl. 428—81 **9 Claims**



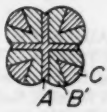
1. A multi-layer front door plate for furniture, especially for kitchen cabinet doors, which includes in combination: a core plate of pressed chip material having a front side and a smooth rear side both coated with a synthetic resin and having plate defining edges, and a coat of soft integral foamed synthetic material arranged only on said resin coated front side and surrounding said plate defining edges to preclude all sharpness thereof and comprising a transitioned rounded section where said front side merges with said edges also covered with said coat of soft integral foamed synthetic material, the rear side except for edges being free of foamed synthetic material so that only the synthetic resin coats the rear side.

4,073,988

SUEDE-LIKE ARTIFICIAL LEATHERS AND A METHOD FOR MANUFACTURING SAME

Takeshi Nishida, Ibaragi; Masao Morioka, Sabae; Tetsuro Ohta, Joyo, and Yukio Yamakawa, Hofu, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Division of Ser. No. 546,873, Feb. 4, 1975, abandoned. This application Nov. 29, 1976, Ser. No. 745,851
Claims priority, application Japan, Feb. 8, 1974, 49-16429; Dec. 18, 1974, 49-146170
Int. Cl.² B32B *33/00;* D02G *3/00;* D06C *11/00*
U.S. Cl. 428—91 **11 Claims**



1. An artificial leather having a suede-like texture, consisting of a shrunk fabric selected from the group consisting of pile woven fabrics, raised woven fabrics, pile knitted fabrics and raised knitted fabrics, said fabric consisting of a substrate having napped piles projecting therefrom and uniformly distributed over the entire surface of the substrate at a high nap density, said piles having a length of 0.5 to 4.0 mm, said piles consisting essentially of fibrillated composite filaments consisting of synthetic polymers having mutually low adhesive affinity to each other, said fibrillated composite filaments having been obtained by filbrillating composite filaments which in transverse cross-section consist of at least three integral layers (A) of one polymer wherein said layers diverge from each other substantially radially in the outward direction and extend to the perimeter of the filament and the spaces between said layers are filled with either segments (B) of another polymer or concave segments (B') of said another polymer the concavities of which are filled with segments (C) of a different polymer, wherein all of the polymers extend to the perimeter of the filament, so that the polymers are separated from each other, said fabric having been shrunk from 10 to 40% of its original area and then having been impregnated with from 3 to 40 percent by weight, based on the weight of said fabric, of a substantially microporous synthetic polymer, the piles having been buffed after impregnation with said polymer to transform same to napped piles consisting of uniformly dispersed separate very fine fibrils of (A) and (B) or (A), (B') and (C) having a nap fibril denier of from 0.05 to 1 denier and a nap fibril length of from 0.2 to 3.0 mm.

4,073,989

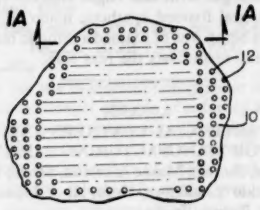
CONTINUOUS CHANNEL ELECTRON BEAM MULTIPLIER

Eugene Wainer, Shaker Heights, Ohio, assignor to Horizons Incorporated, Cleveland, Ohio

Filed Jan. 17, 1964, Ser. No. 338,363
Int. Cl.² B32B *3/04*
U.S. Cl. 428—131 **6 Claims**

1. A fully virified ceramic element comprising a thin wafer having at least one aperture extending through said wafer, and perpendicular to the major surfaces of said wafer, the composition of said wafer consisting essentially of between 10 and 50

mole percent of at least one oxide selected from the group consisting of the oxides of Cs, Rb, K, Be, Mg, Ca, Ba, Sr, Ce, La, Yt and Zn, and between 90 and 40 mole percent of oxide of



a metal selected from the group consisting of titanium, tin and niobium and between 0.5 and 3 mole percent of an oxide forming compound of at least one element selected from the group consisting of Ag, Au, Pd, Mo, W, and Sb.

4,073,990

APPARATUS FOR ADJUSTING A SEMICONDUCTOR WAFER BY ELECTRON BEAM ILLUMINATION

Hans Friedrich, Poering, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 7, 1976, Ser. No. 684,081

Claims priority, application Germany, May 9, 1975, 2520743

Int. Cl.[2] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 428—138 **5 Claims**

1. Apparatus for the adjustment of a semiconductor wafer by electron beam illumination whereby the position of the semiconductor wafer is established by detecting signals corresponding to the electron beam illumination, comprising:

a. a semicondcutor wafer having a first layer thereon;

b. an adjustment mark provided in the semiconductor wafer as a recess which extends through an aperture in the first layer and into the semiconductor wafer, the width of said recess being not greater than its depth; and

c. an electron sensitive lacquer layer arranged on the first layer whereby the depth of said recess in relation to its width functions as a cage for capturing a large proportion of secondary and back-scattered electrons to permit more precise alignment.

4,073,991

PERFORATED, EMBOSSED FILM TO FOAM LAMINATES HAVING GOOD ACOUSTICAL PROPERTIES AND THE PROCESS FOR FORMING SAID

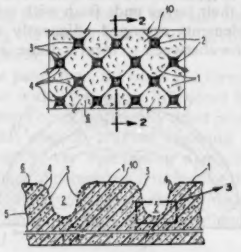
Bruce E. Focht, Trainer, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

Continuation of Ser. No. 476,216, June 4, 1974, abandoned. This application Oct. 18, 1976, Ser. No. 733,277

Int. Cl.[2] B32B *3/24, 3/30;* **E04B** *1/84*

U.S. Cl. 428—138 **5 Claims**

1. An acoustical film-to-foam laminate comprising an open cell foam having a deformable film, said foam having a surface embossed with a non-random, predetermined pattern having crowns, sidewalls and valleys, the deformable film being adhesively attached to the embossed surface of the foam, conforming to the pattern on the embossed surface and having perforations through the film predominately in the sidewalls and



valleys of the pattern, said valleys having a depth of at least 1/160 of an inch.

4,073,992

PRINTING ON A POLYOLEFIN SUBSTRATE

Frank Lerman, Cincinnati, and Raymond C. Bartsch, Wyoming, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 311,180, Dec. 1, 1972, abandoned, and a continuation-in-part of Ser. No. 23,044, March 26, 1970, abandoned. This application Nov. 15, 1974, Ser. No. 524,176

Int. Cl.[2] B41M *5/26*

U.S. Cl. 428—207 **10 Claims**

1. A method of forming an image on a polyolefinic substrate which comprises applying a dry fusible powder consisting of a pigment, an olefin polymer or copolymer and up to 10% of a silica flow additive in a predetermined pattern on the surface of said polyolefin substrate, fusing the powder particles to each other and to the substrate surface by maintaining the substrate at a temperature of about 115° to 140° C., and adherently bonding the pigmented powder to the substrate by cooling the pattern bearing substrate to effect solidification of the powder.

9. An article having an image thereon comprising a non-pretreated polyolefin substrate and adherently bonded thereto in a predetermined pattern, a pigmented, fused powder consisting of a pigment, an olefin polymer or copolymer and up to 10% of a silica flow additive.

4,073,993

HYDROPHILIC FINISHING PROCESS FOR HYDROPHOBIC FIBERS

John C. Lark, St. Charles, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 560,503, March 20, 1975, abandoned. This application Dec. 20, 1976, Ser. No. 752,518

Int. Cl.[2] B05D *3/02;* **B32B** *27/06, 27/34, 27/36*

U.S. Cl. 428—261 **14 Claims**

1. A process for treating textiles and textile fibers with a partial ester having at least one retained unreacted acid group on the molecule after the esterification to impart a durable hydrophilic antistatic antisoiling finish which comprises the steps of (1) providing a water soluble reaction product consisting essentially of a polyethylene glycol of an average molecular weight of 100 to 6000 and an aromatic polycarboxylic acid compound selected from the group consisting of trimellitic anhydride, trimellitic acid, pyromellitic dianhydride, pyromellitic acid, phthalic anhydride and phthalic acid wherein the compound is capable of forming a four to six membered cyclic acid anhydride ring, wherein the mole ratios are within the range of 1:1 to 1:2, glycol to acid, the reaction temperature of said glycol and said acid being in the range of from about 130° to 175° C, the said partial esters being characterized by acid numbers within the range of 17 through 286 when said ester is a monoester and 4 through 95 when said ester is a diester, (2) coating, and (3) curing said reaction product on said textile and

textile fibers, the said textiles being selected from the group of textiles and textile fibers consisting of polyesters, polyamides and polyester-polyamide blends.

4,073,994

ACID MODIFIED POLYVINYL ACETATE TEXTILE SIZES

James C. Baatz, West Springfield, and Donald D. Donermeyer, Springfield, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 14, 1977, Ser. No. 777,381
Int. Cl.[2] B05D *3/02*
U.S. Cl. 428—265 12 Claims

1. A textile sizing solution which comprises a vinyl acetate interpolymer and a water dispersible polymer selected from the group consisting of polyvinyl alcohol and starch wherein the interpolymer comprises from about 64.5 to about 95.0 weight percent of vinyl acetate, from about 4.0 to about 9.5 weight percent of acrylic acid, from about 0.2 to about 1 weight percent of 2-acrylamido-2-methylpropanesulfonic acid and from about 0 to about 25 weight percent of an ethylenically unsaturated monomer selected from the group consisting of alkyl acrylates, dialkyl maleates and dialkyl fumarates wherein the alkyl groups contain from 1 to 8 carbon atoms and wherein the weight ratio of the interpolymer to the water dispersible polymer is in the range of about 95:5 to about 5:95.

4,073,995

ACID MODIFIED POLYVINYL ACETATE TEXTILE SIZES

James C. Baatz, West Springfield, and Donald D. Donermeyer, Springfield, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 14, 1977, Ser. No. 777,380
Int. Cl.[2] B32B *27/00*
U.S. Cl. 428—265 22 Claims

1. A textile sizing solution which comprises an interpolymer comprising from about 64.5 to about 95.8 weight percent of vinyl acetate, from about 4.0 to about 9.5 weight percent of acrylic acid, from about 0.2 to about 1 weight percent of 2-acrylamido-2-methylpropanesulfonic acid and from about 0 to about 25 weight percent of an ethylenically unsaturated monomer selected from the group consisting of alkyl acrylates, dialkyl maleates and dialkyl fumarates wherein the alkyl groups contain from 1 to 8 carbon atoms.

4,073,996

FABRIC TREATING ARTICLES AND PROCESSES

William Thomas Bedenk, Springfield Township, Hamilton County, and Paul Joseph Sagel, Green Township, Hamilton County, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 24, 1976, Ser. No. 660,951
Int. Cl.[2] D06M *11/00;* B05D *3/12*
U.S. Cl. 428—274 19 Claims

1. An article of manufacture especially adapted for conditioning fabrics in an automatic clothes dryer, comprising:

(a) an effective amount of a smectite clay/organic fabric conditioning agent mixture wherein the weight ratio of organic fabric conditioning agent to smectite clay is from about 200:1 to about 1:1 and wherein the organic fabric conditioning agent is cationic; and

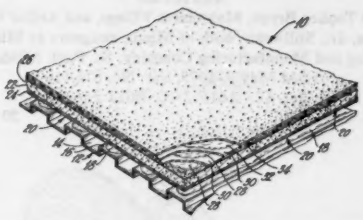
(b) a dispensing means which provides for release of said mixture within an automatic clothes dryer.

4,073,997

COMPOSITE PANEL

David O. Richards, Newark; Isaac P. Jones, Granville; Homer W. Duffee, Newark, and Charles E. Nutter, Hebron, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 530,110, Dec. 6, 1974, abandoned, which is a division of Ser. No. 263,746, June 9, 1972, Pat. No. 3,874,980. This application Sept. 17, 1976, Ser. No. 724,129
Int. Cl.[2] B32B *17/10*
U.S. Cl. 428—285 13 Claims



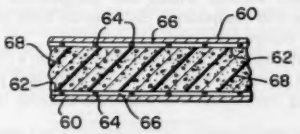
1. A roof insulating system comprising a roof deck; an adhesive layer on said roof deck; roof insulation on said layer, said roof insulation comprising a slab of expanded organic polymeric material having two major, substantially planar, substantially parallel surfaces and a peripheral edge of predetermined shape, said slab having a thickness from about one-half inch to about four inches, a thin mat of substantially randomly-disposed glass fibers on the upper major surface of said slab with the mat disposed substantially uniformly over said entire major surface, said fibers being held together by a binder, the polymeric material at the upper edge of said slab at least partially penetrating interstices among the fibers of said mat in a manner to be functionally integral therewith, and a layer of glass fibers affixed to the lower major surface of said slab, the polymeric material at the lower surface of said slab at least partially penetrating interstices among the fibers of the latter layer in a manner to be functionally integral therewith; a second adhesive layer on the upper surface of said mat; and a mat of fibers impregnated with asphalt on top of said second layer.

4,073,998

SCRIM/FOIL LAMINATE

Terence James O'Connor, St. Catharine's, Canada, assignor to Bay Mills Limited, St. Catharine, Canada

Filed Jan. 24, 1977, Ser. No. 762,210
Int. Cl.[2] B32B *3/26*
U.S. Cl. 428—310 19 Claims



1. A laminate providing a high strength, low flammability, moisture vapor barrier, especially adapted for use in polyurethane foam construction panels comprising

a metal foil;

an adhesive tie-coat coating one surface of said foil, said tie-coat comprising an organic adhesive compound having a high hydroxyl functionality, low organic acid functionality, low flammability, and which is thermoplastic at temperatures above about 200° F.; and

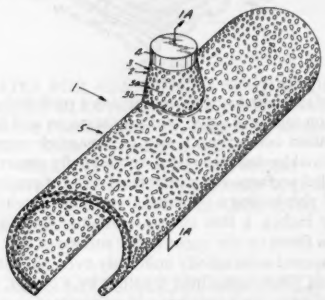
a scrim attached to said foil by the tie-coat, said scrim being made of yarns which are non-flammable and dimensionally stable.

4. A construction panel comprising at least one laminate as defined in claim 1 having applied to the tie-coated surface a polyurethane foam, said polyurethane foam being prepared from a hydroxyl containing material and an isocyanate material comprising an isocyanate or isocyanurate, said isocyanate material and the hydroxyl groups of said organic adhesive compound having been reacted to chemically bond the foam and compound and thereby bonding the foam to said foil.

4,073,999
POROUS CERAMIC OR METALLIC COATINGS AND ARTICLES

Thomas Toplica Bryan, Mahtomedi Village, and Arthur William Pluim, Jr., Stillwater, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 9, 1975, Ser. No. 576,110
Int. Cl.[2] A61F *1/00*; B01J *21/00*
U.S. Cl. 428—311 **20 Claims**



1. A method for preparing coated substrates comprising:
(A) contacting a substrate selected from the class consisting of a ceramic substrate and metallic substrate with a composition to provide a coating of said composition on at least a portion of said substrate, said composition comprising:
(1) 25 to 80 percent by weight of a material selected from the class consisting of ceramic powder and powdered metal wherein the number average of the longest dimension of the particles of the material is from about 0.1 to about 300 microns;
(2) 2.0 to 12 percent by weight of a binder capable of adhering said material particles; and
(3) 18 to 73 percent by weight solvent;
(B) rapidly volatilizing at least a portion of said solvent of said composition on said substrate to form volatilized solvent bubbles within said composition which escape from said composition and thereby form porosity within said composition and
(C) sintering said coated substrate to form a coated substrate with a porous coating, said pores of said porous coating being from about 4 to about 350 microns in diameter.

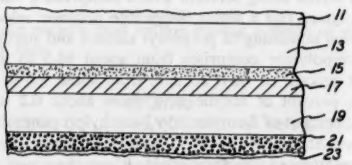
4,074,000
PRESSURE SENSITIVE ADHESIVE DRAFTING FILMS FOR USE IN ELECTROSTATOGRAPHIC COPIERS

Roy H. Hankee, Penfield, and Alp T. Akman, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 27, 1976, Ser. No. 736,034
Int. Cl.[2] B32B *5/16, 19/02, 27/08*
U.S. Cl. 428—323 **14 Claims**

1. A layered, pressure sensitive, self-adhesive drafting film suitable for imaging in electrostatographic copiers which comprises from the top downward:
a. a matte coating capable of receiving a holding graphic information;
b. a layer of an organic resinous material as support for the matte coating;
c. a pressure sensitive adhesive;
d. a silicone release coating;
e. a layer of an organic resinous material as release liner; and
f. a back coating which is a layer of an organic binder material having dispersed therein:
i. a particulate material of particle size ranging from 3 to 20 microns in the longest dimension; and
ii. a water insoluble antistatic agent of a type and in an amount sufficient to cause the film to have a surface resistivity in the range of from 10^9 to 10^{14} ohms/sq.

14. A multi-layered pressure sensitive drafting film suitable for imaging in electrostatographic copiers which comprises from the top down:



a. a matte film capable of receiving and holding graphic information;
b. a layer of organic resinous material;
c. a layer of pressure sensitive adhesive;
d. a release coating;
e. a layer of an organic resinous material as release liner;
f. a back coating comprising an organic binder material having dispersed therein a particulate material of particle size ranging from 3 to 20 microns in the longest dimension; and
g. a thin (0.01 mil to 0.06 mil) layer of an anti-static agent of a type which causes the film to have a surface resistivity in the range of from 10^9 to 10^{14} ohms/sq.

4,074,001
FIXING ROLL FOR ELECTROPHOTOGRAPHY

Kiyoshi Imai; Nobuyuki Hasebe, both of Annaka; Tomiaki Asami, Numazu; Setsuo Soga, Mitaka; Ichiro Fukushima, and Yasuo Asahina, both of Tokyo, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd. and Ricoh Company, Ltd., both of Tokyo, Japan

Filed June 23, 1976, Ser. No. 698,897
Claims priority, application Japan, June 24, 1975, 50-76848
Int. Cl.[2] B32B *15/08*; G03G *13/20*
U.S. Cl. 428—329 **7 Claims**

1. A fixing roll for electrophotography having a surface layer with a thickness of at least 1 mm composed of a cured room-temperature vulcanizing silicone rubber composition comprising
A. 100 parts by weight of a mixture consisting of
a. from 80 to 40% by weight of a diorganopolysiloxane terminated at both chain ends with diorganohydroxysilyl groups directly bonded to the terminal silicon atoms, having a viscosity of from 100 to 500,000 centistokes at 25° C and
b. from 20 to 60% by weight of a diorganopolysiloxane terminated at both chain ends with trialkylsilyl groups, having a viscosity of from 5 to 200 centistokes at 25° C,
B. from 0.5 to 10 parts by weight of an alkoxysilane represented by the general formula

$$R_a^1Si(OR^2)_{4-a}$$

where R^1 and R^2 are saturated or unsaturated monovalent hydrocarbon groups and a is 0 or 1, or a partial hydrolysis-condensate of the alkoxysilane,

C. from 0.1 to 5 parts by weight of a metal salt of an organic acid,

D. from 10 to 80 parts by weight of powdery calcium carbonate with an average particle diameter of not exceeding 10 μm,

E. from 10 to 80 parts by weight of powdery iron oxide with an average particlediameter of not exceeding 10 μm, and

F. from 10 to 80 parts by weight of powdery titanium dioxide with an average particle diameter of not exceeding 10 μm.

4,074,002

MAGNETIC RECORDING MEDIA HAVING A LOW COEFFICIENT OF FRICTION

Joachim Hack, Ludwigshafen; Dieter Schaefer, Lindenberg, and Herbert Motz, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Mar. 8, 1976, Ser. No. 664,644

Claims priority, application Germany, Mar. 21, 1975, 2512450

Int. Cl.[2] H01F *10/02*

U.S. Cl. 428—331 **3 Claims**

1. A magnetic recording medium comprising a flexible base and, applied thereto, at least one firmly adhering magnetic layer, at least the uppermost magnetic layer consisting essentially of finely divided magnetic particles and non-magnetic particles in an organic binder mixture, wherein the non-magnetic particles used are particles of precipitated silica having a mean primary particle diameter of from 0.02 to 0.1μ, a mean secondary particle diameter of from 2 to 4μ, a pH of from 5 to 8, a loss of weight on drying from about 2 to 5% and a loss of weight on ignition of from about 4 to 6%.

4,074,003

THERMOGRAPHIC STENCIL SHEET, ASSEMBLY AND METHOD OF MAKING AN IMAGED STENCIL SHEET

Margery L. Schick, Mount Prospect, and Bror E. Anderson, Arlington Heights, both of Ill., assignors to Weber Marking Systems, Inc., Arlington Heights, Ill.

Continuation of Ser. No. 521,033, Nov. 5, 1974, abandoned. This application May 11, 1976, Ser. No. 685,324

Int. Cl.[2] B41N *1/24*

U.S. Cl. 428—341 **13 Claims**

1. An assembly for making an imaged stencil sheet and adapted to provide a visual index of the degree of imaging, said assembly comprising a thermographic stencil sheet, and a receiving sheet arranged for surface contact with said stencil sheet, said stencil sheet comprising:

an ink-pervious fibrous tissue base sheet having a weight of about 4½ to 12 lbs. per 2000 sq. ft., and

at least two layers of a heat-flowable composition providing an ink-impervious coating on the base sheet,

a first one of said layers being adapted for imaging contact with an original and said first layer being essentially colorless, and

a second one of said layers being adapted for surface contact with said receiving sheet whereby said composition when rendered flowable by heat upon imaging transfers to the receiving sheet in the pattern of ink-transmitting image openings formed in the stencil sheet,

said second layer containing pigment or dye coloring material in an amount sufficient to provide a visible index of the degree of imaging on said receiving sheet but insufficient to increase substantially the infrared absorptivity of the stencil sheet, said coloring material being present in a maximum amount of about 0.07 lb. per 3,000 sq. ft.

4,074,004

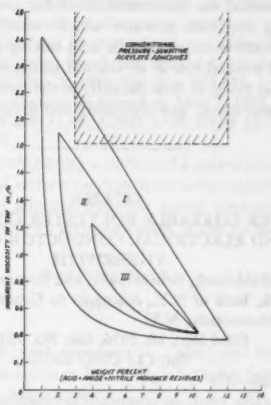
PRESSURE-SENSITIVE ADHESIVE TAPE EMPLOYING MOISTURE RESISTANT ACRYLATE-BASE COPOLYMER ADHESIVE

George F. Bateson, Roseville; Francis W. Brown, West St. Paul, and Steven M. Heilmann, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 2, 1976, Ser. No. 702,347

Int. Cl.[2] C09J *7/02*

U.S. Cl. 428—355 **15 Claims**



1. In a sheet material comprising a sheet backing and a normally tacky and pressure-sensitive acrylate-based copolymer firmly bonded to at least one face thereof,

the improvement which comprises said pressure-sensitive copolymer having an inherent viscosity in tetrahydrofuran of at least about 0.4 dl/g at 25° C. and being a polymer of 100 parts by weight of homopolymerizable ethylenically unsaturated monomers consisting essentially of

(1) from about 88 to about 99 parts by weight of monomers consisting of

(a) 85–100 weight percent acrylic acid ester of at least one non-tertiary alkyl alcohol the molecules of said alcohol containing 1–14 carbon atoms, the average being about 5–12 carbon atoms, and

(b) correspondingly 15–0 weight percent of at least one monomer selected from the group consisting of vinyl acetate, styrene, vinyl ethers and alkyl methacrylates, and

(2) correspondingly from about 12 to about 1 part by weight of conjugated vinyl monomers selected from at least one of the classes listed below, said monomers being selected in types and amounts to impart tacky and pressure-sensitive adhesive properties to said copolymer:

(a) at least one carboxylic acid selected from the group consisting of acrylic acid, methacrylic acid and itaconic acid,

(b) at least one amide containing 3–4 carbon atoms, and

(c) at least one nitrile containing 3–4 carbon atoms,

no more than 10 parts by weight of either class (a) or class (c) monomers and no more than 7 parts by weight of class (b) monomers being employed,

said polymer falling beneath the line $y = (14 - x/5)$, where y = inherent viscosity in deciliters per gram as measured in tetrahydrofuran at 25° C. and x = the total weight percent of the vinyl monomers in "(2)" above, the copolymer having a wet shear strength of at least about 2 lbs/in^2,

whereby said sheet material applied to dry fabrics remains

firmly bonded thereto upon being thereafter exposed to moisture for extended periods of time.

4,074,005

FLOCK TREATMENT

Ricky L. Moore, Atlanta, and Winston E. Hagborg, Columbus, both of Ga., assignors to West Point-Pepperell Inc., West Point, Ga.

Filed Feb. 20, 1976, Ser. No. 659,629
Int. Cl.[2] B05D *5/08, 7/02, 1/18*
U.S. Cl. 428—378 **22 Claims**

1. A method for the treatment of flock which comprises suspending the flock in water which contains a linear, saturated aliphatic monocarboxylic acid having at least 8 carbon atoms and a metal ion, in an amount sufficient to increase the flow of said flock, at least partially in the form of a salt of said acid and said metal, and separating and drying the flock.

4,074,006

POWDER COATABLE POLYESTER COMPOSITION AND ELECTRICAL CONDUCTOR COATED THEREWITH

Edith M. Boldebuck, Schenectady, and Bernard Gorowitz, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 16, 1976, Ser. No. 751,045
Int. Cl.[2] C08G *63/76*
U.S. Cl. 428—379 **18 Claims**

1. A curable resinous composition comprising

(I) a polyester resin consisting essentially of the reaction product of (a) from about 25 to 56 equivalent per cent of a material selected from the class consisting of isophthalic acid, terephthalic acid, lower dialkyl ester of isophthalic acid, lower dialkyl ester of terephthalic acid, and mixtures thereof, (b) from about 15 to 46 equivalent per cent of a diol, and (c) from about 13 to 44 equivalent per cent of a saturated aliphatic polyhydric alcohol having at least three hydroxyl groups, the sum of said equivalent percents being equal to 100 per cent, and

(II) an organic ester of ortho-titanic acid in an amount corresponding to from about 0.02 to about 0.045 part by weight of titanium per 100 parts by weight of said resin.

4,074,007

COATING COMPOSITION

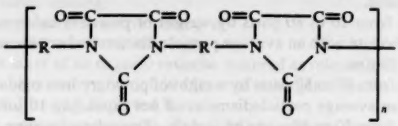
Gerhard Gebauer, Burgkirchen (Alz); Johannes Brandrup, Neu Isenburg; Kurt Kraft, Auringen, Taunus, and Franz Mayer, Burgkirchen (Alz), all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 560,295, March 20, 1975, abandoned. This application Mar. 23, 1977, Ser. No. 780,466
Claims priority, application Germany, Mar. 26, 1974, 2414389
Int. Cl.[2] B32B *27/04;* **C08J** *3/08;* **C08K** *5/00;* **C08L** *79/04*
U.S. Cl. 428—411 **15 Claims**

1. Coating composition for application as one-coat system which comprises

a. from 10 to 90 parts by weight of a low molecular weight polytetrafluorethylene having a melt viscosity of from 10^1 to 10^8 poises (measured at 380° C by means of the high pressure capillary viscometer), a specific surface of from 1 to 40 m^2/g (measured according to the BET method), and a mean particle diameter of from 0.1 to 50 microns;

b. from 90 to 10 parts by weight of a polymer containing triketo-imidazolidine rings and repeated units of the formula



where

R is a mono- to trinuclear, bi- to tetravalent aromatic radical, the aromatic radicals optionally being also quinones, and in polynuclear systems the aromatic radicals optionally being linked by aliphatic radicals or hetero atoms, furthermore the aromatic radicals optionally being mono- or polysubstituted by alkyl, cycloalkyl, alkoxy, aryl or monovalent functional radicals,

R′ is as defined for R or an aliphatic or cycloaliphatic hydrocarbon radical,

n is an integer of from 1 to 70, and

c. an aprotic organic solvent having a surface tension of more than 30 dyn/cm, in an amount by weight of from 0.43 to 100 times that of component b); up to 80% of the amount by weight of this aprotic solvent having a surface tension of more than 30 dyn/cm optionally being replaced by another organic solvent not meeting at least one of the two cited requirements, but necessarily having a boiling point at least 10° C lower than the boiling point of the aprotic solvent.

12. A process for the coating of surfaces, wherein the coating composition as claimed in claim 1 is used.

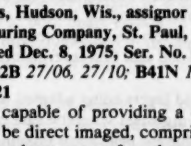
4,074,008

EPOXIDE RESINS

George Edward Green, Cambridge, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 3, 1976, Ser. No. 711,325
Claims priority, application United Kingdom, Aug. 13, 1975, 33678/75
Int. Cl.[2] C08F *2/46;* **G03C** *1/68;* **C23F** *1/02;* **C08F** *4/00*
U.S. Cl. 428—418 **35 Claims**

1. Epoxide resins which polymerise on exposure to actinic radiation, having, per average molecule, at least two photopolymerisable groups and also at least two 1,2-epoxide groups, one or more such epoxide groups being contained in units of formula



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4,074,009

DRIOGRAPHIC MASTER

James F. Sanders, Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 8, 1975, Ser. No. 638,454
Int. Cl.[2] B32B *27/06, 27/10;* **B41N** *1/12;* **G03F** *7/20*
U.S. Cl. 428—421 **6 Claims**

1. An article capable of providing a driographic printing plate which can be direct imaged, comprising a substrate having a coating on at least one surface thereof, said coating comprising a fused particulate binder compound characterized by high surface energy and easy wettability when exposed to printing ink having a solid, at less than 100° F, heat-softenable fluorinated compound uniformly dispersed therethrough in a manner such that the surface of said coating is oleo ink repellent when dry; said fluorinated compound containing at least one fluorinated aliphatic radical therein having at least one terminal perfluoromethyl group, said coating containing no

material serving to flow at ordinary image-marking temperatures to heal image-marked areas therein.

4,074,010
CERAMIC-PAINT COATINGS

Clifford J. Knight, Transfer, Pa., assignor to Lyle V. Anderson, Pittsburgh, Pa., a part interest

Continuation-in-part of Ser. No. 576,255, May 12, 1975, abandoned. This application Sept. 29, 1975, Ser. No. 617,249
Int. Cl.[2] B32B *27/00, 17/06, 9/04, 13/04*
U.S. Cl. 428—422 **24 Claims**

1. An article of manufacture comprising a substrate having thereon a first coat or layer of ceramic paint having a pH level of at least about 11 and including a vehicle with chemically-bound water and an aqueous colloidal suspension of silica and alumina having a particle size within the range of 5 to 10 millimicrons thus creating a reactive form of aluminum silicate due to said pH level to produce a paint-wet surface, said surface having partly embedded therein an effective number of particles of finely-divided substance stable at the temperature of intended use, said ceramic paint being cured after heating said substrate, ceramic paint and particles to 250°–750° F to release water including said chemically-bound water from the vehicle of said ceramic paint without fusing said ceramic paint.

4,074,011
TOPCOATED PHOSPHATED BOLTS, NUTS AND WASHERS

Akira Teramae, Yokohama; Koji Yamada, Tokyo, and Hironobu Kawasaki, Machida, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 569,755, April 21, 1975, abandoned. This application Aug. 27, 1976, Ser. No. 718,131
Claims priority, application Japan, Apr. 25, 1974, 49-46877
Int. Cl.[2] B32B *15/04;* **F16B** *27/00*
U.S. Cl. 428—422 **1 Claim**

1. A bolt, nut and washer having an adherent, corrosion resistant, lubricious and paintable coating applied on the surface thereof, said coating being composed of an under-coating layer of phosphate of metals having a weight of 0.1 to 50 g/m^2, and a top-coating layer of a weight of 0.1 to 50 g/m^2 and containing a paintable base-forming vehicle, a chromium compound present in an amount of 0.5 to 25% by weight of chromium based on the dried weight of the top coating, and a lubricity-imparting ingredient of one or more materials selected from the group consisting of metal salts of higher fatty acid in an amount from 1 to 20%, polyolefin compounds in an amount from 1 to 50%, and polyethylene tetrafluoride in an amount from 1 to 50%, these percents being % by weight based on the dried weight of the top coating.

4,074,012
FINE-METAL-PARTICLE-BASED MAGNETIC RECORDING MEDIUM OF IMPROVED ENVIRONMENTAL STABILITY

Duane G. Heikkinen, North St. Paul, Minn., and Thomas M. Kanten, Baldwin Township, St. Croix County, Wis., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 320,630, Jan. 2, 1973, abandoned. This application Aug. 29, 1975, Ser. No. 608,916
Int. Cl.[2] H01F *10/02*
U.S. Cl. 428—425 **10 Claims**

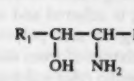
1. Magnetic recording medium comprising a magnetizable layer carried on a nonmagnetizable support, the magnetizable layer comprising (a) a nonmagnetizable organic polymeric binder material; (b) fine magnetizable particles that comprise at least 75 weight-percent metal, at least a majority of which is iron, cobalt, or nickel, uniformly and thoroughly dispersed in the binder material; and (c) an organic compound having a molecular weight of less than 500 and providing, per gram of particles, at least 0.0001 gram-equivalent of sterically unhindered aliphatic tertiay amine which is located in terminal groups on the organic compound, is not reacted with said binder material and has a pK_a of at least 8 when measured in an aqueous solution at 25° C, whereby the recording medium exhibits improved resistance to corrosion of said magnetizable particles.

4,074,013
CORRODIBLE IRON-CONTAINING SURFACES CARRYING CORROSION-INHIBITING COATING

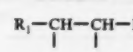
Karlheinz Koch, Haan; Gerhard Kolaczinski, Dusseldorf-Oberkassel; Wolfgang Rupilius, Dusseldorf, and Werner Stein, Erkrath-Unterbach, all of Germany, assignors to Henkel KGaA, Dusselfdorf and Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, both of Germany

Filed May 5, 1976, Ser. No. 683,516
Claims priority, application Germany, May 7, 1975, 25202785
Int. Cl.[2] C23F *11/00;* **C09D** *5/08;* **B32B** *15/04*
U.S. Cl. 428—457 **9 Claims**

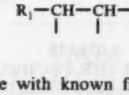
1. A shaped article having a surface of a corrodible iron-containing metal, said surface carrying a corrosion-inhibiting coating of a material selected from the group consisting of (A) mixtures of at least two amino-alkanols of the formula:



wherein R_1 and R_2 each represent C_{1-21} alkyl; and wherein the sum of the carbon atoms in R_1 and R_2 is between 6 and 22; and (B) salts thereof, the vicinal

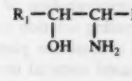


substituents being statistically distributed along the

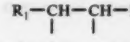


chain in accordance with known frequency of distribution curves.

7. A process for inhibiting the tendency of a shaped article having a surface of a corrodible iron-containing metal to corrode when in contact with an aqueous medium, which comprises uniformly coating said surface with a corrosion-inhibiting material selected from the group consisting of (A) mixtures of at least two aminoalkanols of the formula:



wherein R_1 and R_2 each represent C_{1-21} alkyl; and wherein the sum of the carbon atoms in R_1 and R_2 is between 6 and 22; and (B) salts thereof, the vicinal



substituents being distributed uniformly along the

chain.

4,074,014

ARTICLE INCLUDING ACRYLIC ADHESIVE BONDING VINYL COATINGS TO POLYMERIC SUBSTRATES

Carl H. Wollen, Comstock Park, Mich., assignor to Leon Chemical & Plastics, Division of U.S. Industries, Inc., Grand Rapids, Mich.

Continuation of Ser. No. 412,669, Nov. 5, 1973, abandoned. This application Jan. 6, 1976, Ser. No. 646,948

Int. Cl.[2] B32B *27/08*

U.S. Cl. 428—506 19 Claims

1. An article comprising a vinyl resin covering of a material suitable for molding onto a substrate and containing plasticizer consisting of substantially only phthalate esters; a polymeric substrate of a material forming a hard substrate surface to which said vinyl resin covering is adhered and an adhesive bonding said vinyl resin covering to said polymeric substrate, said adhesive comprising a mixture of from about 1 wt. percent to about 95 wt. percent phenolic resin solids and from about 5 wt. percent to about 99 wt. percent methacrylate resin solids, said methacrylate resin having a weight average molecular weight greater than about 400,000.

16. An article comprising a vinyl resin covering of a material suitable for molding onto a substrate and containing plasticizer consisting substantially only phthalate esters; a polymeric substrate of material forming a hard substrate surface to which said vinyl resin covering is adhered and an adhesive bonding said vinyl resin covering to said polymeric substrate, said adhesive comprising a mixture of from about 1 wt. percent to about 95 wt. percent phenolic resin solids and from about 5 wt. percent to about 99 wt. percent methacrylate resin solids, said methacrylate resin being a copolymer of methacrylate and normal or isobutyl acrylate wherein the methyl methacrylate comprises from about 40 to about 75 wt. percent of the copolymer and the normal or isobutyl acrylate comprises from about 20 to about 50 wt. percent of the copolymer, and said methacrylate resin having a weight average molecular weight greater than about 100,000.

4,074,015

PROCESS FOR THE PRODUCTION OF NONFLAMMABLE LAMINATED MATERIALS

Arnold Franz, and Siegfried Kopnick, both of Troisdorf, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Filed June 4, 1975, Ser. No. 583,766

Claims priority, application Germany, June 4, 1974, 2426862

Int. Cl.[2] B32B *27/10*

U.S. Cl. 428—526 10 Claims

1. In a process for the production of nonflammable laminated materials by the impregnation of cellulose-containing material with an impregnating solution containing a phenolic-resol resin solution, and at least one plasticizer, subsequently drying the thus-impregnated material under preliminary condensation of the resin, and thereafter curing superimposed layers of this impregnated and preliminarily condensed material with the use of heat and pressure, the improvement wherein there is used an impregnating solution containing:

a. 50 to 80% by weight of an ammonia alkaline-condensed aqueous phenol-resol resin with a solids content of 65–80% by weight and with following molecular weight distribution determined by gel chromatography (expressed in percent per unit area): dimers 20–26%; tri- and tetramers 6–12%; penta- and oligomers 24–36%;

b. hexamethylenetetramine in amounts of 1–15% by weight and

c. between 15 and 35% by weight of a phosphoric acid ester as the plasticizer, based on the weight of the impregnating solution.

4,074,016

MAGNETIC RECORD CARRIER

Gerhard Trippel, Sindelfingen, Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 9, 1976, Ser. No. 749,209

Claims priority, application Germany, Dec. 17, 1975, 2556755

Int. Cl.[2] B32B *15/00*

U.S. Cl. 428—626 14 Claims

1. A multi-layer magnetic record carrier, comprising:

a substrate;

a synthetic substance layer deposited onto said substrate;

a layer of getter metal vacuum deposited onto said synthetic substance layer; and

a layer of an undercoat metal vacuum deposited onto said getter metal layer, said undercoat metal layer being substantially thicker than said getter metal layer.

4,074,017

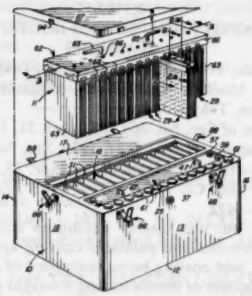
BATTERY FOR ELECTRIC POWERED VEHICLES

Lewis R. Kinsey, Phoenix, Ariz.

Filed Nov. 22, 1976, Ser. No. 743,537

Int. Cl.[2] H01M *2/06, 2/36*

U.S. Cl. 429—1 7 Claims



1. A storage battery of the wet cell type having a plurality of cells, each cell being provided with a group of plates having post members extending upwardly from each plate into the upper portion of the cells comprising:

a box-like battery case having partitions dividing the same into at least two compartments,

one of said compartments being open at the top of said battery case for the reception of said cells and the other of said compartments being closed at the top of said battery case and being used for the storage of an extra supply of electrolyte over that utilized in said one of said compartments,

a removable plate assembly for positioning in said one of said compartments,

said plate assembly comprising a supporting member arranged to receive in interlocking relationship a plurality of groups of plates detachably and spacedly arranged along said supporting member, said groups of plates being insulated one from the other when in a juxtapositioned arrangement, bus bars extending longitudinally of and within said plate assemblies for connecting together the post members of the plates of said groups of plates in positive and negative voltage orientation,

means for inter-connecting corresponding cells in said plate assembly and said other compartment for providing passageways for the free flow of electrolyte therebetween, and

a cover for said box-like battery case extending over at least one of said compartments,

said supporting member being spacedly grooved to receive in interlocking relationship in said grooves a plurality of

groups of said plates spacedly arranged with one group of plates detachably positioned in each of said grooves,

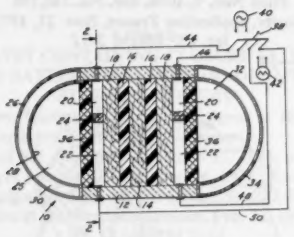
each group of plates being a complete cell assembly removably mounted as a cell structure on said supporting member,

each cell assembly being provided with a projection which cooperates with its associated groove to restrict the insertion of each group of plates into one end only of the grooves.

4,074,018
SECONDARY FUEL CELL

Ronald J. Haas, San Jose, and Donald C. Briggs, Mountain View, both of Calif., assignors to Ford Aerospace & Communications Corporation, Dearborn, Mich.

Filed May 4, 1977, Ser. No. 793,906
Int. Cl.² H01M *4/86*
U.S. Cl. 429—21 **1 Claim**



1. A secondary fuel cell which comprises:

a housing;

an electrolyte retaining zone extending across a cross section of said housing;

an electrolyte in said electrolyte retaining zone;

a pair of gas impermeable, ion permeable reservoir zones, one such zone being located on each side of said electrolyte retaining zone and extending across the cross section of said housing;

a pair of electrode zones, one such zone being located on the side of each of said pair of gas impermeable, ion permeable reservoir zones not in contact with said electrolyte retaining zone, said pair of electrode zones each containing a pair of electrode structures, a first such electrode structure being more efficient in operation during charging of the fuel cell and a second of such electrode structures being more efficient in operation during discharge of the fuel cell;

an electrolyte retaining zone with electrolyte contained therein positioned between said first electrode zone and said second electrode zone of each of said pair of electrode zones;

structure means secured to said housing for defining gas containing zones for the fuel and the oxidant of the cell;

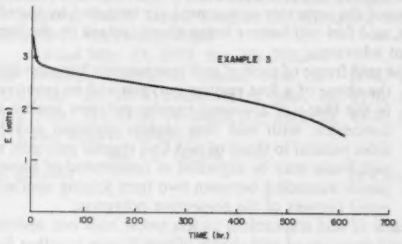
a pair of gas permeable but electrolyte impermeable zones extending across the cross section of said housing, one such zone being located between each one of said pair of electrode zones and its associated gas containing zone; and

means for using during charging of the cell said electrode more efficient in charging and for using during discharge of said cell said electrode more efficient in discharging.

4,074,019
CELL HAVING FLUORINATED CARBON CATHODE AND SOLVATED ALKALI METAL SALT ELECTROLYTE

Paul A. Malachesky, Berkeley Heights, and Gerald H. Newman, Westfield, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Mar. 1, 1977, Ser. No. 773,283
Int. Cl.² H01M *10/44*
U.S. Cl. 429—50 **13 Claims**



1. A current producing cell comprising:

a. a cathode having a compound formed of fluorine and carbon;

b. an alkali metal-containing anode; and

c. a solid electrolyte consisting essentially of one or more solvated compounds of the formula:

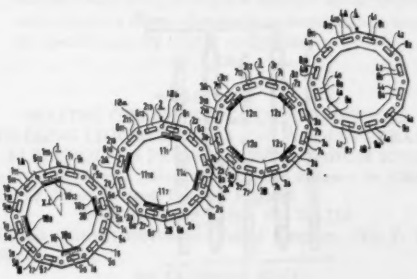
$$ZMX_n$$

wherein Z is an alkali metal, wherein M is a metal selected from the group consisting of Zn, Cd, B, Al, Ga, In, Tl, Sn (stannous), P and As, wherein X is one or more halogens selected from the group consisting of chlorine, fluorine, bromine and iodine, and wherein *n* is a numerical value equal to one plus the valence of the metal M, said compounds having been solvated with one or more solvents selected from the group consisting of unsubstituted and inertly substituted monoethers and polyethers.

4,074,020
CROSS-FEED FUEL CELL BATTERY WITH FILTER PRESS TYPE STRUCTURE OF POLYGONAL CROSS-SECTION

Bernard Regnaut, Antony, France, assignor to Societe Generale de Constructions Electriques et Mecaniques "Alsthom et Cie", Paris, France

Filed Feb. 2, 1976, Ser. No. 654,694
Claims priority, application France, Feb. 6, 1975, 75.03663; Feb. 6, 1975, 75.03665
Int. Cl.² H01M *8/04*
U.S. Cl. 429—34 **11 Claims**



1. A fuel cell battery formed of an assembly similar to that of

a filter press comprising plate-like components in a repeating order of sequence embodying the elementary cell sequence of a cathode, a separator, an anode and a current collector, each of said components having substantially the same contour and being in the form of thin plates having an outer frame of an electrically insulating material surrounding a central active portion, the respective faces of the respective active portions of the cathode and anode components which face away from the separator component being respectively irrigated by the combustion supporting material and by the fuel, while the two faces of the separator component are irrigated by the electrolyte, said fuel cell battery being characterized by the improvement wherein:

the said frame of each of said components has a perimeter in the shape of a first regular polygon and an inner contour in the shape of a second regular polygon similar to and concentric with said first regular polygon and having sides parallel to those of said first regular polygon, so that said frame may be regarded as constituted of trapezoidal panels extending between two lines joining similarly oriented corners of the respective polygons;

each of said trapezoidal panels has at least one opening;

said openings of said panels of said frames together forming six sets of channels in which each set consists of at least one channel, of which one of said sets of channels is arranged for supply of combustion supporting material to the active portions of said cathode components, a second of said sets of channels is arranged for supply of electrolyte to both of the separator faces, a third set of said channels is arranged for supply of fuel to the active portions of the anode components, a fourth of said sets of channels is arranged for removal of used combustion supporting material, a fifth of said sets of channels is arranged for removal of the electrolyte and a sixth of said sets of channels is arranged to remove the reaction products of the fuel, and

said channels and their connections to the respective active portions of the respective components of said battery are so disposed that the average direction of flow of said electrolyte across said separator faces is at the same predetermined acute angle to the respective average directions of flow of said fuel and of said combustion supporting material across the active portions respectively of said anode and said cathode in the same cell.

4,074,021

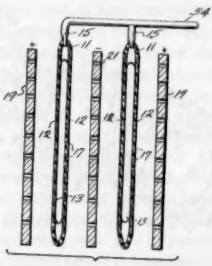
HIGH DISCHARGE BATTERY WITH DEPOLARIZED PLATES

Robert R. Aronson, West Bloomfield, Mich., assignor to Electric Fuel Propulsion Corporation, Detroit, Mich.

Continuation of Ser. No. 584,498, June 6, 1975, abandoned, which is a continuation-in-part of Ser. No. 385,324, Aug. 3, 1973, Pat. No. 3,928,080, which is a continuation of Ser. No. 26,218, April 7, 1970, abandoned. This application Oct. 19, 1976, Ser. No. 733,842

Int. Cl.[2] H01M *2/38*

U.S. Cl. 429—51 **17 Claims**



1. An improved rechargeable battery system for an electrically powered vehicle including a battery casing, a plurality of battery plates positioned in said casing in parallel spaced relationship with one another and an electrolyte positioned in said casing and covering said battery plates, the improvement comprising:

a plurality of envelope separators, each having a plurality of small openings therein for permitting the ingress and egress of said electrolyte with respect thereto and a tube communicating with a source of electrolyte, said envelope separators being positioned between and in substantially parallel spaced relationship with said battery plates, said envelope separators having a surface area extending over substantially the entire surface of said battery plates, and means for forcing said electrolyte from the inside of said envelope separators outwardly through said openings toward the surfaces of said battery plates, said electrolyte being in contact with substantially the entire area of said battery plates and flushing away waste products positioned proximate said battery plates and increasing the concentration of electrolyte at the surface of said battery plates, whereby the efficiency of said rechargeable battery system for an electrically powered vehicle is improved.

4,074,022

CASING OF AN ELECTRIC CELL

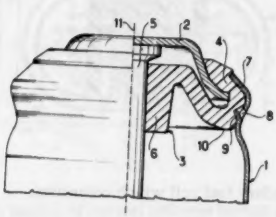
Guy Nadal, Poitiers, France, assignor to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville, France

Filed Nov. 9, 1976, Ser. No. 740,198

Claims priority, application France, Nov. 21, 1975, 75.35689

Int. Cl.[2] H01M *2/12*

U.S. Cl. 429—54 **5 Claims**



1. A casing of an electric cell, the casing including a metal wall whose inner surface is in close contact with an elastically deformable block which encloses a volume for active materials within the casing, the wall being provided with an orifice normally separated by said block from the enclosed volume of said casing and communicating with said enclosed volume by deformation of the block when the internal pressure reaches a determined value, wherein said orifice is in the form of a tongue cut in the metal wall and turned down towards the enclosed volume without being detached from the remainder of the wall.

4,074,023

PRIMARY DRY CELL WITH MASKED SEPARATOR

Lewis Frederick Urry, North Olmsted, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Apr. 2, 1975, Ser. No. 564,490

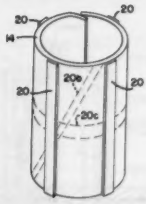
Int. Cl.[2] H01M *2/12*

U.S. Cl. 429—56 **13 Claims**

1. A primary dry cell comprising a metal anode cup of magnesium having an open top end which is gas-tightly sealed by a closure including a vent and having a cathode mix therein comprising particles of a metal oxide depolarizer, finely divided conductive material and an electrolyte, separated from the side wall of said anode cup by an electrolyte-permeable separator, with a void space separating said closure and said cathode mix, and having at least one electrolyte-impermeable stripe lying adjacent said separator over a portion thereof between said anode cup and said separator and extending

substantially the whole distance between the bottom of said anode cup and said void space for providing a gas venting passageway coincident to said impermeable stripe.

12. In a primary dry cell comprising a metal anode cup of magnesium having an open top end which is gas-tightly sealed by a closure and having a cathode mix therein comprising particles of a metal oxide depolarizer, finely-divided conductive material and an electrolyte, separated from the side wall of



said anode cup by an electrolyte-permeable separator, said separator being in contact with said anode cup, the improvement comprising wherein a circumferential stripe of an electrolyte-impermeable material is placed adjacent to said separator between said anode cup and said separator for masking off a portion of the side wall of the anode cup so as to maintain the structural integrity of the anode during consummation of the cell.

4,074,024

CATALYST CONTAINING CLOSURE PLUG FOR STORAGE BATTERY AND METHOD OF OPERATING STORAGE BATTERY

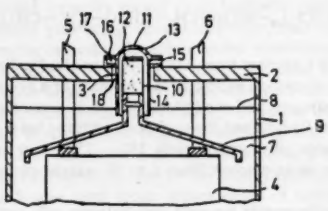
Harald Reber, Gerlingen, Germany, assignor to Robert Bosch GmbH, Gerlingen-Schillerhohe, Germany

Division of Ser. No. 666,585, March 15, 1976, which is a continuation of Ser. No. 532,866, Dec. 16, 1974, abandoned. This application Sept. 29, 1976, Ser. No. 727,937

Claims priority, application Germany, Feb. 22, 1974, 2408556

Int. Cl.² H01M 2/12

U.S. Cl. 429—86 **4 Claims**



1. Closure plug for a storage battery comprising:

a body member adapted to fit into an opening of a battery and having means defining a chamber within the body which is adapted to extend below the liquid level of an electrolyte in a battery, said chamber having at least one opening below the liquid level of the electrolyte to permit a portion of the electrolyte to enter a portion of said chamber;

means defining an upper enclosure in said chamber of said body, said upper enclosure containing a catalyst for recombining evolved hydrogen and oxygen gases from said battery to form water vapor;

directing means in communication with said chamber and at least adjacent said chamber for directing said evolved oxygen and hydrogen gases to said upper enclosure;

a closed non-vented water vapor communication means at least partially defined by said chamber defining means and extending into said electrolyte, said communication means being at least partially located at the end of said body at a level below said upper enclosure to provide a closed conduit to conduct all of the water vapor from said upper enclosure to the portion of said body member which extends below said surface of said electrolyte to bring all of said water vapor into contact with said electrolyte in said chamber to condense said water vapor and intermix condensed with vapor with.

4,074,025

INDICATING DEVICE FOR STORAGE BATTERY

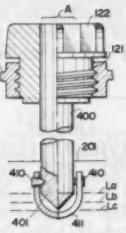
Shiro Miyagawa, Suita, Japan, assignor to Miyagawa Kasei Industry Co., Ltd., Osaka, Japan

Filed Mar. 17, 1977, Ser. No. 778,364

Claims priority, application Japan, Mar. 29, 1976, 51-38766[U]; Mar. 29, 1976, 51-38767[U]; Mar. 29, 1976, 51-38768[U]; Mar. 31, 1976, 51-40621[U]; July 23, 1976, 51-98893[U]; Jan. 6, 1977, 52-901[U]

Int. Cl.² H01M 1/06

U.S. Cl. 429—91 **35 Claims**



1. An indicating device for a storage battery including an electrolytic vessel and an electrolyte contained therein, comprising,

means for transmitting light therethrough adapted to extend from outside said electrolytic vessel toward the interior of said electrolyte contained in said electrolytic vessel of said storage battery for allowing visual observation therethrough of the interior of said electrolyte; and

indicating means adapted to be disposed in said electrolyte in association with a range in which said indication means is visible through said light transmitting means;

said indicating means being rotatable around an axis which extends at right angles with respect to the extending direction of said light transmitting means;

the specifc gravity of said indicating means being correlated with the specific gravity of a battery electrolyte;

the center of buoyancy of said indicating means in said electrolyte being deviated from said axis of rotation, whereby said indicating means is rotated by the sinking and floating thereof caused in response to changes in the specific gravity of said electrolyte;

the manner of indication as viewed through said light transmitting means being changed in response to the rotation of said indicating means, thereby to indicate the condition of the specific gravity of said electrolyte.

4,074,026

SEALING OF ELECTROCHEMICAL DEVICES UTILIZING LIQUID SODIUM AND A SOLID CERAMIC ELECTROLYTE PERMEABLE TO SODIUM IONS

Roger John Bones, Abingdon, England, assignor to Chloride Silent Power Limited, London, England

Filed Feb. 4, 1977, Ser. No. 765,714

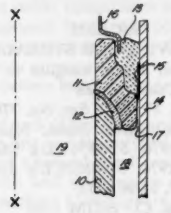
Claims priority, application United Kingdom, Feb. 9, 1976, 5030/76

Int. Cl.² H01M 10/38

U.S. Cl. 429—104 **13 Claims**

1. In an electrochemical device having a sodium-containing region partially bounded by a sodium-ion permeable solid

ceramic electrolyte element and having the sodium-containing region sealed by a sodium-resistant glass seal joining the ceramic electrolyte element or a ceramic extension thereof to a metal member, the improvement which comprises providing a protective layer of film of niobium secured to said metal member in the region thereof exposed to the sodium in said sodium-containing region, and extending into said glass seal to protect at least the periphery of the interface between said glass seal and said metal member which is subjected to exposure to the sodium.

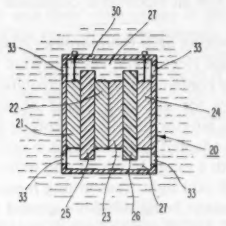


4,074,027

GENERATING DEVICE UTILIZING IRRADIATED COPPER ELECTRODE

Raymond F. Akers, 202 Summit Ave., Mantua, N.J. 08051, and Frank Malley, 112 Hughes Ave., Gloucester, N.J. 08030

Filed Mar. 4, 1977, Ser. No. 774,467
Int. Cl.[2] H01M *10/24*
U.S. Cl. 429—10 **23 Claims**



1. A generating device comprising:
a. a housing containing electrolyte;
b. a first electrode having a first predetermined surface area immersed in said electrolyte within said housing, said first electrode being of a first metallic composition and having been irradiated with electromagnetic energy in a range centered around about 1.378 A;
c. a second electrode having a second predetermined surface area immersed in said electrolyte within said housing, said second electrode being of a second metallic composition; and
d. output means connected to said electrodes for providing an electrical output on the outside of said housing.

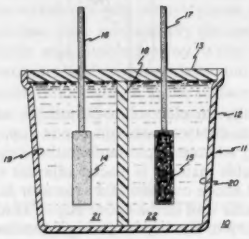
4,074,028

DENDRITE-INHIBITING ELECTROLYTIC SOLUTION AND RECHARGEABLE AQUEOUS ZINC-HALOGEN CELL CONTAINING THE SOLUTION

Fritz G. Will, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 9, 1977, Ser. No. 794,974
Int. Cl.[2] H01M *10/26*
U.S. Cl. 429—105 **10 Claims**

1. A dendrite-inhibiting elecrtrolytic solution comprising a solution containing a zinc compound, from 0.001 to 10 weight percent of a non-ionic surfactant additive having the formula:



$$CF_3(CF_2)_m-SO_2N(R)-CH_2-CH_2(O-CH_2-CH(R^1))_nOH$$

where m is a number from 3 to 15, R is an alkyl radical having from 1 to 10 carbon atoms, R^1 is a member of a group consisting of hydrogen and methyl radical, n is a number for the group from 0 to 30, and the surfactant additive has a molecular weight range of approximately 550 - 1500, and an organic solubilizer in an amount from 5 to 50 weight percent of the solution.

6. A rechargeable aqueous zinc-halogen cell comprising a casing, a pair of spaced apart porous electrode substrates in the casing, an ion exchange membrane between the electrode substrates defining a positive and a negative electrode compartment, an electrolytic solution containing a zinc compound in both compartments, from 0.001 to 10 weight of the solution of a non-ionic surfactant additive in the negative compartment, the non-ionic surfactant additive having the formula:

$$CF_3(CF_2)_m-SO_2N(R)-CH_2-CH_2(O-CH_2-CH(R^1))_nOH$$

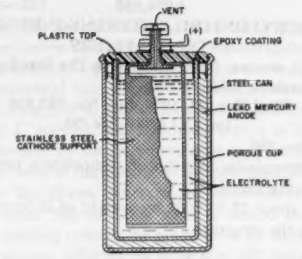
where m is a number from 3 to 15, R is an alkyl radical having from 1 to 10 carbon atoms, R^1 is a member of a group consisting of hydrogen and methyl radical, n is a number for the group from 0 to 30, and the surfactant additive has a molecular weight range of approximately 550 - 1500, and an organic solubilizer in an amount from 5 to 50 weight percent of the solution in the negative compartment.

4,074,029

RECHARGEABLE VOLTAIC CELL WITH LEAD MERCURY AMALGAM ANODE AND LEAD PEROXIDE CATHODE

Samuel Ruben, 52 Seacord Road, New Rochelle, N.Y. 10801

Filed June 3, 1976, Ser. No. 692,464
Int. Cl.[2] H01M *6/16*
U.S. Cl. 429—198 5 Claims



1. A rechargeable voltaic cell comprising an anode of lead mercury amalgam, an electrolyte of lead sulfamate and sulfamic acid and a cathodic reactant of lead peroxide.

4,074,030

PROCESS FOR PRODUCING NICKEL OXIDE CATHODIC REACTANT FOR PRIMARY CELLS

Samuel Ruben, 52 Seacord Road, New Rochelle, N.Y. 10801

Filed Nov. 19, 1976, Ser. No. 743,510
Int. Cl.[2] H01M *4/32*
U.S. Cl. 429—223 5 Claims

1. A process for producing a highly electrically conductive high coulombic capacity nickel oxide cathodic reactant for electric current producing cells which comprises making a metal screen the cathode in a molten nickel nitrate electrolyte, applying adequate electric current for a sufficient length of time to produce large nickel hydroxide dendrites on the exterior surface of said screen and extending outwardly therefrom, washing said dendrites and screen, connecting said dendrite bearing screen as the anode in an aqueous alkaline electrolyte, applying current thereto to convert the oxide dendrites on said screen to a friable hard dense higher oxide of nickel easily brushable off said screen, washing said screen and dendrites, and removing said dendrites from said screen base.

4,074,031

PROCESS FOR PREPARING ELECTRON BEAM RESISTS

Duane Edward Johnson, Los Gatos, and Lester Arlyn Pederson, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 8, 1976, Ser. No. 721,259
Int. Cl.[2] C08F *8/32*
U.S. Cl. 526—49 5 Claims

1. A process for preparing a positive electron beam resist comprising reacting a film which is a copolymer of from 75% to 50% methyl methacrylate and from 25% to 50% methacrylic acid with a tertiary amine.

4,074,032

MANUFACTURE OF HEAT-STABLE BROMINATED OLIGOMERS OF MONOVINYL-AROMATIC COMPOUNDS

Herbert Naarmann, Wattenheim; Klaus Penzien, Frankenthal, and Hermann Gausepohl, Mutterstadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed July 14, 1976, Ser. No. 705,278
Claims priority, application Germany, Aug. 22, 1975, 2537385
Int. Cl.[2] C08F *8/20, 8/22, 8/04*
U.S. Cl. 526—44 5 Claims

1. A process for the manufacture of heat-stable, brominated oligomers of monovinyl-aromatic compounds which comprises:

dissolving selectively hydrogenated oligomers of the monovinyl-aromatic compounds a halogenated solvents; reacting the hydrogenated oligomers with bromine in the presence of a Lewis acid catalyst at a temperature of from — 25° C to + 20° C while starting the reaction solution; washing the reaction solution with water to eliminate bromide ions; and thereafter isolating the brominated reaction product from the reaction solution.

4,074,033

CHEMICAL MILLING OF NEOPRENE RUBBER

Leon E. Wolinski, Cheektowaga; Richard G. Riebling, Hamburg, and John H. Edholm, Tonawanda, all of N.Y., assignors to Pratt & Lambert, Buffalo, N.Y.

Filed July 9, 1976, Ser. No. 703,796
Int. Cl.[2] C08F *8/06, 8/50*
U.S. Cl. 526—47 4 Claims

1. A process for improving the processability of a high molecular weight neoprene polymer which comprises treating a solution of said polymer in an organic solvent with an organic peroxide at room temperature in the presence of oxygen to reduce the molecular weight of said neoprene and lower the viscosity of said solution.

4,074,034

HARDENABLE COMPOSITION

Mitsuo Soga; Yuuzo Takase; Manabu Ishikawa; Masahiko Nakazawa, and Mutumi Nakayama, all of Tokyo, Japan, assignors to Asahi Denka Kogyo K.K., Tokyo, Japan

Filed Sept. 12, 1975, Ser. No. 612,860
Int. Cl.[2] C08F *8/08*
U.S. Cl. 526—56 4 Claims

1. A hardenable composition comprising as a film-forming component a final polymer prepared by reacting (A) a starting polymer prepared by cationic polymerization and consisting of 60 to 100 mole percent of 1,3-pentadiene units and zero to 40 mole percent of 1,3-butadiene units wherein from 50 to 90 molar percent of said units are in cis-1,2 and trans-1,2 configuration and the balance of said units are in 3,4, cis-1,4 and trans-1,4 configuration, said starting polymer having an average molecular weight of about 300 to 10000, with (B) an aqueous solution containing more than 30 up to about 90 weight percent of hydrogen peroxide wherein the amount of hydrogen peroxide is from 0.7 to 3.0 moles per unit mole of said starting polymer, and with (C) a carboxylic acid having the formula RCOOH, wherein R is hydrogen or alkyl having one to three carbon atoms, wherein the amount of said carboxylic acid is from 0.1 to 3.0 moles per unit mole of said starting polymer, the reaction being carried out at 30° to 100° C to obtain said final polymer having a molecular weight of 320 to 15000 and containing 12 to 25 percent of epoxy groups, from 4 to 20 percent of hydroxy groups and acyloxy groups, based on the double bonds contained in the starting polymer, and wherein the ratio of epoxy groups : hydroxy groups : acyloxy groups is 5 to 9 : 1 to 5 : 1 to 5 by equivalents.

4,074,035

HALOMETHYLATED AROMATIC INTERPOLYMERS

Kenneth W. Powers, Berkeley Heights, and Irving Kuntz, Linden, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Apr. 22, 1975, Ser. No. 570,352
Int. Cl.[2] C08F 4/14, 4/42, 212/00
U.S. Cl. 526—185 2 Claims

1. A continuous process for the preparation of gel-free interpolymers comprised of isobutylene and a mixture of from 0.5 to 5.0 mol % meta and para chloromethyl styrene which comprises:

(a) continuously feeding said monomers in the range of about 2 to about 20 parts by weight, about 80 to about 98 parts by weight of a solvent or mixture of solvents in which said monomers and said interpolymers are soluble and from about 0.001 to about 0.05 parts by weight of a catalyst selected from the group consisting of ethyl aluminum dichloride, ethyl aluminum sesquichloride, diethyl aluminum chloride, or boron trifluoride to a reaction zone maintained at a temperature in the range of about −120° C. to about −20° C. to form a reaction mixture;

(b) maintaining said reaction mixture in said reaction zone at said temperature for a time sufficient to convert at least one of said monomers to said interpolymer in an amount equal to or greater than about 85 percent; and

(c) recovering said interpolymer from the effluent reaction mixture leaving said reaction zone.

4,074,036

PRODUCTION OF LOW MOLECULAR WEIGHT POLYANHYDRIDES

Harold W. Tuller, Long Valley, and Ralph W. Nussbaum, West Orange, both of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Nov. 5, 1976, Ser. No. 739,215
Int. Cl.[2] C08F 4/12, 212/06, 220/08
U.S. Cl. 526—238 15 Claims

1. In a process for the production of a low molecular weight polyanhydride having a softening point within the range of 111° to 156° C., by the mass polymerization reaction of a maleic monomer and at least one vinyl monomer selected from the group consisting of styrene and alkyl-substituted styrenes at a temperature in the range of about 140° to 200° C., the improvement comprising employing an alkali metal bifluoride as catalyst for said reaction.

4,074,037

THERMOPLASTIC TERPOLYMERS OF ACRYLONITRILE, VINYL ESTERS AND INDENE

George S. Li, Aurora, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Feb. 28, 1977, Ser. No. 772,724
Int. Cl.[2] C08F 244/00
U.S. Cl. 526—280 8 Claims

1. The terpolymer composition resulting from the copolymerization of

A. from about 50 to 80% by weight of at least one nitrile having the structure

$$CH_2=\underset{\displaystyle R}{\overset{|}{C}}-CN$$

wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen,

B. from about 10 to 40% by weight of a vinyl ester having the structure $R_1COOCH=CH_2$ wherein R_1 is hydrogen or an alkyl group having from 1 to 5 carbon atoms, and

C. from about 10 to 20% by weight of at least one member selected from the group consisting of indene and coumarone,

wherein the given percentages of (A), (B) and (C) are based on the combined weight of (A) plus (B) plus (C).

4,074,038

ACRYLONITRILE-STYRENE-INDENE INTERPOLYMERS

George S. Li, Aurora, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 23, 1976, Ser. No. 753,920
Int. Cl.[2] C08F 244/00
U.S. Cl. 526—280 8 Claims

1. A thermoplastic terpolymer composition resulting from the polymerization of

A. from about 25 to 50% by weight of at least one nitrile having the structure

$$CH_2=\underset{\displaystyle R}{\overset{|}{C}}-CN$$

wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen,

B. from about 30 to 70% by weight of a vinyl aromatic monomer selected from the group consisting of styrene, alpha-methyl styrene, the vinyl toluenes and the vinyl xylenes, and

C. from about 5 to 20% by weight of at least one member selected from the group consisting of indene and coumarone wherein the given percentages of (A), (B) and (C) are based on the combined weights of (A), (B) and (C).

4,074,039

HYDROPHILIC N,N-DIETHYL ACRYLAMIDE COPOLYMERS

Drahoslav Lim, Stanford, Calif.; Jindrich Kopecek, Prague, Czechoslovakia; Hedvika Bazilova nee Sverinova, Nymburk, Czechoslovakia, and Jiri Vacik, Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Continuation-in-part of Ser. No. 363,153, May 23, 1973, abandoned, which is a continuation-in-part of Ser. No. 124,567, March 15, 1971, abandoned. This application Feb. 12, 1976, Ser. No. 657,602
Claims priority, application Czechoslovakia, Mar. 26, 1970, 2020/70
Int. Cl.[2] C08F 220/54
U.S. Cl. 526—303 10 Claims

1. A hydrophilic gel for use in exposure to repeated or long term contact with live tissues or mucous membranes and consisting of marcomolecules obtained by polymerizing a mixture consisting of 43 to 0.1 parts by weight of a monomer selected from the group consisting of N-(2-hydroxypropyl) methacrylamide, N,N-dihydroxy ethylacrylamide, N-methyl methacrylamide, N-ethyl methacrylamide, acrylonitrile and methacrylonitrile, 52 to 99.5 parts by weight of N,N-diethyl acrylamide and 5 to 0.4 parts by weight of a crosslinking divinylic monomer selected from the group consisting of glycol dimethacrylate, diethylene glycol dimethacrylate, triethylene glycol dimethacrylate, methylene-bis-acrylamide and ethylene-bis- methacryl-amide in the presence of a free radical initiator.

4,074,040
MANUFACTURE OF ETHYLENE POLYMERS IN AN AUTOCLAVE REACTOR

Dieter Oeder, Weisenheim; Hans Gropper, Ludwigshafen, and Friedrich Urban, Limburgerhof, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Jan. 10, 1977, Ser. No. 758,208
Claims priority, application Germany, Mar. 18, 1976, 2611405
Int. Cl.[2] C08F *2/02, 10/02*
U.S. Cl. 526—352 2 Claims

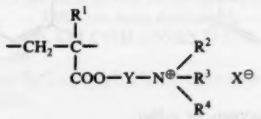
1. A process for the manufacture of an ethylene polymer by homopolymerization of ethylene or copolymerization of ethylene with one or more copolymerizable monomers by introducing the monomer(s) into a polymerization system in which pressures of from 500 to 5,000 bars and temperatures of from 100° to 300° C prevail, and removing a part of the heat of reaction generated by the polymerization by means of a cooling system located in the interior of the polymerization system but separate therefrom, wherein the monomer(s), under a pressure of from 500 to 5,000 bars, is passed continuously through the cooling system, the pressure of the monomer(s) in the cooling system differing by from 0 to 200 bars from that prevailing in the polymerization system and the temperature of the monomer(s) on entering the cooling system being at least 40° C lower than the temperature prevailing in the polymerization system.

4,074,041
PROCESS FOR PREPARING SOLID WATER SOLUBLE POLYMERS

Takashi Nishikaji; Kenzo Watanabe, both of Sagamihara, and Shigeru Sawayama, Machida, all of Japan, assignors to Mitsubishi Chemical Industries Limited and Kyoritsu Yuki Co., Ltd., both of Tokyo, Japan

Filed Aug. 25, 1976, Ser. No. 717,742
Int. Cl.[2] C08F *6/12*
U.S. Cl. 528—488 9 Claims

1. In a method of dehydrating an aqueous solution or jelly of a water soluble polymer which contains units of a quaternary ammonium salt of an alkylacrylate or a methacrylate having the formula:



wherein R^1 represents hydrogen or methyl; R^2, R^3, and R^4 represent C_1–C_4 lower alkyl or aralkyl having 1 to 4 carbon atoms in the alkyl moiety;

Y is alkylene or hydroxy substituted alkylene having 2 to 4 carbon atoms; and

X is halogen;

wherein said quaternary ammonium salt has been homopolymerized or copolymerized with a comonomer; the improvement which comprises adding from 2 to 50 wt. parts to 100 wt. parts of said water soluble polymer of a strong acid salt of a divalent metal selected from the group consisting of calcium, magnesium and barium to said aqueous solution or jelly.

4,074,042
PSEUDO-ISOCYTIDINE

Kyoichi Aloisius Watanabe; Chung Kwang Chu, both of Portchester, and Jack Jay Fox, White Plains, all of N.Y., assignors to Research Corporation, New York, N.Y.

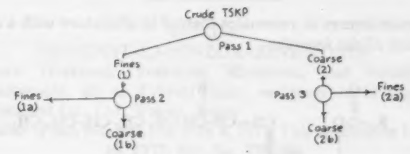
Filed Aug. 7, 1975, Ser. No. 602,692
Int. Cl.[2] C07H *7/06*
U.S. Cl. 536—1 15 Claims

1. Pseudo-isocytidine and pharmaceutically acceptable acid addition salts thereof.

4,074,043
PURIFICATION OF TAMARIND GUM

Duane A. Jones, Minneapolis, Minn., and Wesley A. Jordan, Dallas, Tex., assignors to General Mills Chemicals, Inc., Minneapolis, Minn.

Filed Mar. 15, 1976, Ser. No. 666,994
Int. Cl.[2] C08B *37/00*
U.S. Cl. 536—52 9 Claims



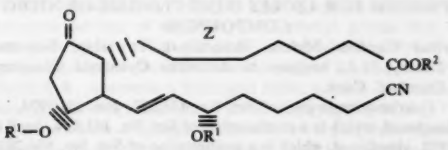
1. A process for purification of crude tamarind seed polysaccharide comprising finely grinding crude tamarind seed kernel powder to a particle size of less than 100 microns, said particle size having a gradation of particle size and air classifying said finely ground crude tamarind seed kernel powder into at least a first fine fraction having an increased protein content and a decreased polysaccharide content and a second coarse fraction having a reduced protein content and an increased polysaccharide content.

4,074,044
CYANOPROSTAGLANDINS

Hans-Jurgen E. Hess, and Thomas K. Schaaf, both of Old Lyme, Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 712,361, Aug. 6, 1976, Pat. No. 4,045,465.
This application Apr. 25, 1977, Ser. No. 790,234
Int. Cl.[2] C07C *177/00;* C07D *309/10*
U.S. Cl. 542—402 3 Claims

1. A compound of the formula



wherein

R^1 is 2-tetrahydropyranyl;

R^2 is selected from the group consisting of hydrogen, alkyl having from one to four carbon atoms and 4-biphenylyl; and Z represents a single bond or a cis double bond.

4,074,045
2H-CYCLOPENTA[b]FURAN-2-ONES AND PROCESS FOR PREPARATION

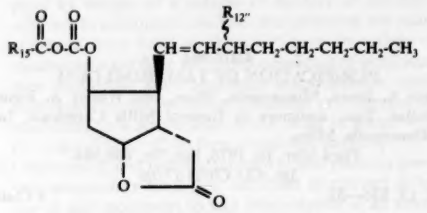
Frank Kienzle, Therwil, Switzerland, and Perry Rosen, North Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 381,322, July 20, 1973, abandoned, which is a continuation-in-part of Ser. No. 300,633, Nov. 25, 1972, abandoned. This application Sept. 10, 1975, Ser. No. 612,132

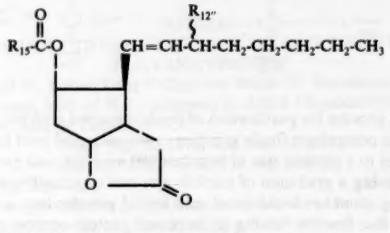
Int. Cl.[2] C07D *307/77*

U.S. Cl. 542—426 **3 Claims**

1. A composition of matter containing a compound of the formula:



or enantiomers or racemates thereof in admixture with a compound of the formula:



or enantiomers or racemates thereof,

wherein R_{15} taken together with its attached

is a radical derived from a conventional aromatic per-organic carboxylic acid by removal of the hydroxy of the per-carboxylic acid group; R_{12}'' is lower alkanoyloxy, benzoyloxy, benzyloxy, benzhydryloxy, tetrahydropyranyloxy, 4-methoxy-5,6-dihydro-2H-pyranyloxy, or trimethyl silyloxy.

4,074,046
PROCESS FOR AZOLES (RING CLOSURE OF NITRO COMPOUNDS)

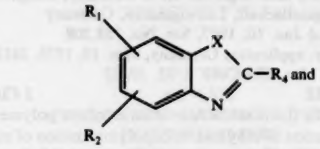
Arthur Gaudens Mohan, Branchburg Township, Somerset County, N.J., assignor to American Cyanamid Company, Stamford, Conn.

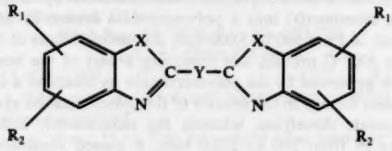
Continuation-in-part of Ser. No. 435,377, Jan. 21, 1974, abandoned, which is a continuation of Ser. No. 241,814, April 6, 1972, abandoned, which is a continuation of Ser. No. 846,282, July 30, 1969, abandoned. This application Oct. 14, 1976, Ser. No. 731,978

Int. Cl.[2] C07D *413/06, 263/54, 277/60*

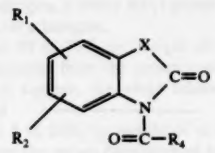
U.S. Cl. 542—439 **6 Claims**

1. A process for preparing 2-substituted azoles having the formulas:

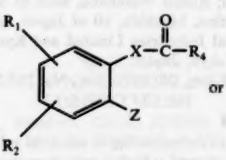




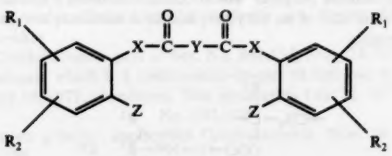
and N-acylazolinones having the formula:



which comprises reacting a nitrogenous compound of the formula:



or



wherein X is oxygen, or sulfur:

R_4 is selected from the group consisting of alkyl C_1–C_{15}, alkenyl C_2–C_4, aryl C_6–C_{10}, or aralkynyl C_8–C_{10};

R_1 and R_2 are independently hydrogen, alkyl C_1–C_4 and halo, or when taken together on adjacent carbon atoms, $-CH=CH-CH=CH-$;

Y is alkenylene; and

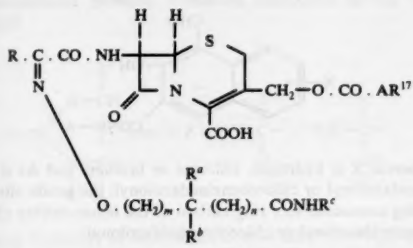
Z is nitro, azo, or azoxy; with carbon monoxide in the presence of a polar or non-polar solvent for the nitrogenous compound and a co-catalyst composition consisting essentially of about 10^{-5} to 0.5 gram-atom palladium or rhodium and about 5×10^{-4} to 0.15 mol of iron halide per mol of nitrogen atom, at a temperature of above 60° C. but below the decomposition temperature of said nitrogenous compound and a pressure of about 40 psig to 100,000 psig.

4,074,047
7[2-(AMINOCARBONYLALKOXYIMINO)ACETAMIDO] DERIVATIVES OF CEPHALOSPORIN

Michael W. Foxton, Chalfont, St. Giles; Gordon I. Gregory, Chalfont, St. Peter, and David M. Rogers, Ulverston, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

Filed June 9, 1976, Ser. No. 694,465
Claims priority, application United Kingdom, June 19, 1975, 26188/75
Int. Cl.[2] C07D *501/32, 501/34*
U.S. Cl. 544—30 6 Claims

1. A compound selected from the group consisting of a cephalosporin antibiotic of the formula



wherein R is phenyl, thienyl or furyl; R^a and R^b are each hydrogen, C_{1-4} alkyl, C_{2-4} alkenyl, C_{3-7} cycloalkyl, carboxy, C_{2-5} alkoxycarbonyl, aminocarbonyl, N-(C_1.C_4alkyl)aminocarbonyl or cyano, or R^a and R^b together with the carbon atom to which they are attached form a C_{3-7} cycloalkylidene or cycloalkenylidene group; R^c is hydrogen or C_{1-4} alkyl; *m* and *n* are each 0 or 1 such that the sum of *m* and *n* is 0 or 1; A is >O, >S or >NH; and R^{17} is hydrogen or C_{1-7} alkyl and a physiologically acceptable salt, metabolically labile ester or 1-oxide thereof.

4,074,048
PROCESS FOR THE PREPARATION OF 4-HYDROXY-2H-1,2-BENZOTHIAZINE-3-CARBOXAMIDE 1,1-DIOXIDES

Harold Zinnes, Rockaway; Neil A. Lindo, New Providence, and John Shavel, Jr., Mendham, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 10, 1976, Ser. No. 685,011
The portion of the term of this patent subsequent to May 18, 1993, has been disclaimed.
Int. Cl.[2] C07D *279/02, 417/12*
U.S. Cl. 544—49 1 Claim

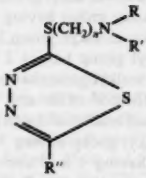
1. 4-hydroxy-N-(2-pyridyl)-2H-1,2-benzothiazine-3-carboxamide 1,1-dioxide.

4,074,049
ANTITHROMBOTIC 1,3,4-THIADIAZOLE

Louis E. Begin, and Joseph E. Dunbar, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 19, 1976, Ser. No. 743,200
Int. Cl.[2] C07D *413/4*
U.S. Cl. 544—82 9 Claims

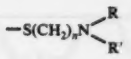
1. A compound of the formula



wherein *n* is the integer 2, 3, or 4;

R and R′ represent saturated aliphatic hydrocarbon moieties of from 1 to 4 carbon atoms or taken together with the nitrogen atom represent pyrrolidino, hexahydro-(1H)-azepinyl and morpholino;

and R″ represents amino or a moiety having the formula



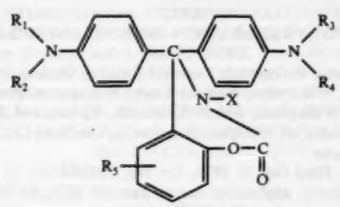
wherein *n*, R, and R′ are the same as defined above or the pharmaceutically-acceptable non-toxic acid addition salts thereof.

4,074,050
DIPHENYL-1,3-BENZOXAZINE-2-ONES

Minoru Ozutsumi; Yoshihide Miyazawa, and Masahiko Yamaguchi, all of Tokyo, Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan

Division of Ser. No. 594,173, July 8, 1975. This application Mar. 16, 1977, Ser. No. 778,280
Claims priority, application Japan, July 8, 1974, 49-77348
Int. Cl.[2] C07D *265/28*
U.S. Cl. 544—92 4 Claims

1. A triphenylmethane compound represented by the formula (Ia);



(Ia)

wherein R_1 and R_3, which may be the same or different, each represents, a lower alkyl group having 1 to 4 carbon atoms, a benzyl group or a phenyl group, in which the aromatic nucleus of the benzyl and phenyl groups may be substituted with a lower alkyl group having 1 to 4 carbon atoms, a lower alkoxy group having 1 to 4 carbon atoms or a di-lower alkylamino group having 1 to 4 carbon atoms in each of the alkyl moieties thereof; R_2 and R_4, which may be the same or different, each represents a hydrogen atom, a lower alkyl group having 1 to 4 carbon atoms, a benzyl group or a phenyl group in which the aromatic nucleus of the benzyl and phenyl groups may be substituted with a halogen atom or a di-lower alkylamino group having 1 to 4 carbon atoms in each of the alkyl moieties thereof; R_5 represents a hydrogen atom, a lower alkyl group having 1 to 4 carbon atoms, a lower alkoxy group having 1 to 4 carbon atoms, a halogen atom, a di-lower alkylamino group having 1 to 4 carbon atoms in each of the alkyl moieties thereof, a dibenzylamino group, an N-lower alkyl-N-benzyl group having 1 to 4 carbon atoms in the alkyl moiety thereof or an N-lower alkyl-N-phenylamino group having 1 to 4 carbon atoms in the alkyl moiety thereof, in which the aromatic nucleus of the benzyl and phenyl groups may be substituted

with a halogen atom, a lower alkyl group having 1 to 4 carbon atoms, or a lower alkoxy group having 1 to 4 carbon atoms; and X represents a lower alkyl group having 1 to 4 carbon atoms, a lower alkenyl group having 2 to 4 carbon atoms, a cyclohexyl group, an aralkyl group having 1 to 4 carbon atoms in the alkyl moiety thereof or an aryl group, in which the aromatic nucleus of said aralkyl and aryl groups may be substituted with a lower alkyl group having 1 to 4 carbon atoms, a lower alkoxy group having 1 to 4 carbon atoms, a di-lower alkylamino group having 1 to 4 carbon atoms in each of the alkyl moieties thereof, a halogen atom, a nitro group, and when the aralkyl group is a benzyl group, the aromatic nucleus thereof may also be substituted with an N-lower alkyl-N-phenyl group having 1 to 4 carbon atoms in the N-lower alkyl moiety thereof.

4,074,051

3-PYRAZOLIDINONE DERIVATIVES

John Stevens, Harlow, England, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 206,168, Dec. 8, 1971, abandoned, which is a continuation of Ser. No. 853,941, Aug. 8, 1969, abandoned. This application Nov. 29, 1973, Ser. No. 420,292

Int. Cl.² C07D *231/08*

U.S. Cl. 544—140 **5 Claims**

1. 4-Morpholinomethyl-1-phenylpyrazolidin-3-one.

4,074,052

PROCESS FOR PREPARATION OF ISOCYANURIC ACID TRIESTERS

Susumu Handa, Wakayama; Yoshiaki Tanaka, Osaka; Atsushi Nishihata, Wakayama; Sadashi Ueda, Wakayama; Yoshiaki Inamoto, Wakayama; Fumio Tanimoto, Kyoto, and Hisao Kitano, Osaka, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

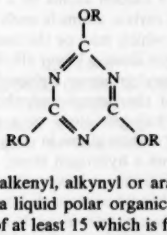
Filed Dec. 9, 1976, Ser. No. 749,053

Claims priority, application Japan, Jan. 19, 1976, 51-4828

Int. Cl.² C07D *251/34*

U.S. Cl. 544—221 **13 Claims**

1. A process of preparing an isocyanuric acid triester, which comprises the steps of heating at a temperature of from 50° to 200° C, a solution of a cyanuric acid triester having the formula



wherein R is alkyl, alkenyl, alkynyl or aralkyl, dissolved in a solvent comprising a liquid polar organic substance having a dielectric constant of at least 15 which is free of active hydrogen atoms and contains a nitrogen or sulfur atom in the molecule and has a boiling point not higher than 260° C, to effect a liquid phase isomerization of said cyanuric acid triester to the corresponding isocyanuric acid triester; and recovering said isocyanuric acid triester from the reaction mixture.

4,074,053

ALDEHYDES OF 2-HYDROXY-NAPHTHALENE-3-CARBOXYLIC ACID ARYLIDES

Klaus Hunger, Kelkheim, Taunus, and Theodor Papenfuhs, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Franfurt am Main, Germany

Division of Ser. No. 489,538, July 18, 1974, Pat. No. 3,947,516. This application Mar. 26, 1976, Ser. No. 670,997

Claims priority, application Germany, July 20, 1973, 2337023

Int. Cl.² C07D *235/26*

U.S. Cl. 548—305 **2 Claims**

1. An aldehyde of a 2-hydroxynaphthalene-3-carboxylic acid arylide of the formula

wherein X is hydrogen, chlorine or bromine and Ar is benzimidazolonyl or chlorobenzimidazolonyl, the amide nitrogen being connected to a ring carbon of the benzo-moiety of said benzimidazolonyl or chlorobenzimidazolonyl.

4,074,054

IMIDAZOLES AND 2-ALKYL IMIDAZOLES AND METHOD FOR THEIR MANUFACTURE

Yani Christidis, Paris, and Dominique Depernet, Stains, both of France, assignors to Nobel Hoechst Chimie, Puteaux, France

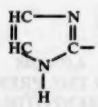
Filed Mar. 31, 1976, Ser. No. 672,493

Claims priority, application France, Apr. 3, 1975, 75 10510

Int. Cl.² C07D *233/58*

U.S. Cl. 548—335 **5 Claims**

1. In the process of manufacturing an imidazole of the structural formula:



wherein R represents hydrogen or alkyl from 1 to 17 carbon atoms, by condensing glyoxal with an alkanal of 1–18 carbon atoms and ammonia, the improvement comprising effecting said condensation at a pH from 6 to 8 in an aqueous alcoholic medium, said glyoxal being in its bisulphitic combination form and said ammonia being provided as an ammonium salt selected from the group consisting of ammonium carbonate, ammonium bicarbonate, and the ammonium salt resulting from the reaction of ammonia with sodium hydrogen sulfite.

4,074,055

PROCESS FOR PREPARING UNSATURATED IMIDAZOLINES

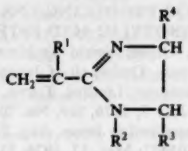
Hans Peter Panzer, Stamford; Michael Niall Desmond O'Connor, Norwalk, and Louis J. Baccei, Farmington, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 467,331, May 6, 1974, Pat. No. 4,006,247. This application Nov. 8, 1976, Ser. No. 740,161

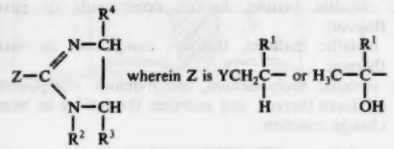
Int. Cl.² C07D *233/06*

U.S. Cl. 548—347 **16 Claims**

1. A method for the production of a compound having the formula



wherein R^1 is hydrogen or methyl and R^2, R^3 and R^4 are, individually, hydrogen, alkyl (C_1–C_4), aryl (C_6–C_{10}), aralkyl (C_7–C_{11}) or alkaryl (C_7–C_{11}) which comprises heating to a temperature ranging from about 275° C to about 500° C, under subatmospheric pressure, a starting compound having the formula



Y being hydroxyl or RO, wherein R is alkyl (C_1–C_{10}), aryl (C_6–C_{10}) or aralkyl (C_7–C_{11}) and R^1, R^2, R^3 and R^4 are as described above, in the presence of heterogeneous vapor phase catalyst and up to about 30%, by weight, based on the weight of said starting compound, of water, and recovering the resultant compound.

4,074,056

3-ALKYL-2-(6-CARBOXYHEXYL) CYCLOPENTANONES AND ESTERS AND SALTS THEREOF

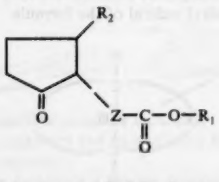
Robert Eugene Schaub, Upper Saddle River, N.J.; Karel Francis Bernady, Suffern, N.Y., and Martin Joseph Weiss, Oradell, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 240,814, April 3, 1972, Pat. No. 4,018,811, which is a continuation-in-part of Ser. No. 225,680, Feb. 11, 1972, abandoned, which is a continuation-in-part of Ser. No. 95,919, Dec. 7, 1970, abandoned. This application Jan. 4, 1977, Ser. No. 756,667

Int. Cl.² C07C *177/00*

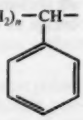
U.S. Cl. 560—51 **10 Claims**

1. A compound selected from the group consisting of those of the formula:



wherein R_1 is hydrogen or alkyl having up to four carbon atoms; R_2 is a straight chain alkyl group having from one to ten carbon atoms, inclusive; and Z is a divalent radical of the formulae:

$-(CH_2)_n-O-CH_2-$, $-(CH_2)_n-S-CH_2-$ or



wherein n is an integer from three to five, inclusive; the stereoisomers thereof; and the cationic salts thereof when R_1 is hydrogen.

4,074,057

2-HALOPROPIONIC ACID AND ITS DERIVATIVES

Yutaka Kawamatsu, Kyoto; Takahiro Saraie, Osaka; Eiko Imamiya, Tondabayashi, and Yukihiko Hamuro, Hyogo, all of Japan, assignors to Takeda Chemical Co., Ltd., Japan

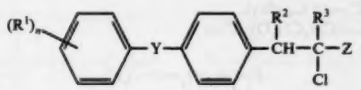
Continuation-in-part of Ser. No. 531,747, Dec. 11, 1974, abandoned. This application Sept. 30, 1976, Ser. No. 728,193

Claims priority, application Japan, Dec. 12, 1973, 48-139199; Apr. 19, 1974, 49-44634; May 22, 1974, 49-58116; Oct. 9, 1974, 49-116559

Int. Cl.² C07C *69/76*

U.S. Cl. 560—55 **30 Claims**

1. A compound of the formula:



wherein R^1 represents hydrogen, lower alkyl having 1 to 5 carbon atoms, halogen, hydroxyl, lower alkoxy having 1 to 4 carbon atoms or trifluoromethyl; R^2 and R^3 are the same or different and each represents hydrogen or lower alkyl having 1 to 5 carbon atoms; Y represents alkylenoxy having 1 to 6 carbon atoms or alkylenedioxy having 1 to 6 carbon atoms; Z represents a carboxyl group or group convertible to a carboxyl group which is an aminocarbonyl group, an alkoxycarbonyl group having 2 to 5 carbon atoms, a mono- or di-alkylaminocarbonyl group having 2 to 9 carbon atoms or mono- or di-arylaminocarbonyl group having 7 to 16 carbon atoms and $n=1$ or 2.

4,074,058

ANTIMICROBIAL ESTERS OF ALIPHATIC DIOLS

August V. Bailey; Gordon J. Boudreaux; Gene Sumrell, all of New Orleans, and Arthur F. Novak, Baton Rouge, all of La., assignors to The United States of America, as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 667,055, March 15, 1976, Pat. No. 4,024,164. This application Feb. 15, 1977, Ser. No. 768,805

Int. Cl.² C07C *69/76, 69/78*

U.S. Cl. 560—105 **2 Claims**

1. 4-Benzoxy-2-butenyl trimethylacetate.
2. 4-Benzoxy-2-butenyl hydrocinnamate.

4,074,059

SUBSTITUTED-1-PHENOL-4-SULFONAMIDES

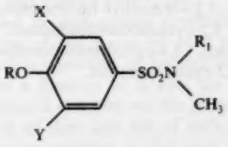
Milon Walker Bullock, Hopewell, and Bryant Leonidas Walworth, Pennington, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 19, 1972, Ser. No. 219,123

Int. Cl.² C07D *143/78*

U.S. Cl. 560—135 **7 Claims**

1. A compound of the formula



wherein X and Y are each selected from the group Br and Cl; R is H or —CO—NH—CH_3; and R_1 is H or CH_3.

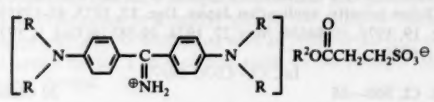
4,074,060

AURAMINE SALTS

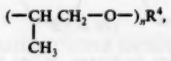
Manfred Eisert, Ludwigshafen, and Karl Schmeidl, Frankenthal, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Jan. 2, 1976, Ser. No. 646,242
Claims priority, application Germany, Jan. 24, 1975, 2502838
Int. Cl.[2] C07C *143/12;* C09D *11/02*
U.S. Cl. 560—149 4 Claims

1. A water soluble compound of the formula



in which
R is C_1—to C_4-alkyl,
R^2 is $-(CH_2CH_2O)_nR^4$ or



n is 1, 2 or 3 and
R^4 is hydrogen or C_1— to C_4-alkyl.

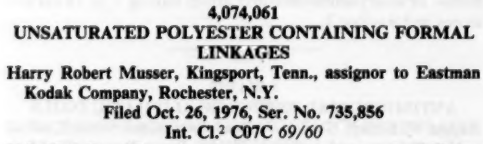
4,074,061

UNSATURATED POLYESTER CONTAINING FORMAL LINKAGES

Harry Robert Musser, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 26, 1976, Ser. No. 735,856
Int. Cl.[2] C07C *69/60*
U.S. Cl. 560—193 5 Claims

1. A polyester having a molecular weight in the range of 1,000 to 3,000 comprised of the following structure



X is a positive number from 2 to 10,
n is a sufficient number of repeating units to achieve the required molecular weight,
R is the divalent radical remaining after removal of the terminal carboxyl groups from an α,β-ethylenically unsaturated dicarboxylic acid, and
R′ is the divalent radical remaining after removal of the terminal hydroxyl groups from an aliphatic or cycloaliphatic glycol selected from the group consisting of 1,6-hexanediol, 1,7-heptanediol, 1,8-octanediol, 1,10-decanediol, 2,2,4-trimethyl-1,6-hexanediol, 1,4-cyclohexanediol, 1,2-cyclohexanedimethanol, 1,3-cyclohexanedimethanol, 1,4-cyclohexanedimethanol, 2,2,4,4-tetramethyl-1,3-cyclobutanediol.

4,074,062

PROCESS FOR PRODUCING UNSATURATED CARBOXYLIC ACID ESTERS

Fumiki Murakami, Otake; Soichi Teshima, Yamaguchi, and Toshihiko Yokoyama, Otake, all of Japan, assignors to Mitsubishi Rayon Company, Limited, Tokyo, Japan

Filed July 7, 1976, Ser. No. 703,263
Claims priority, application Japan, Aug. 21, 1975, 50-101436; Aug. 21, 1975, 50-101437; Mar. 12, 1976, 51-26834
Int. Cl.[2] C07C *69/54*
U.S. Cl. 560—217 17 Claims

1. An ester exchange process which comprises:
preparing an ester of unsaturated carboxylic acid by reacting a lower alkyl ester of an unsaturated, 3–4 carbon atom carboxylic acid with an alcohol different than the alcohol fragment of said lower alkyl ester over a catalyst selected from the group consisting of
1. metallic barium, barium compounds or mixtures thereof;
2. metallic thallium, thallium compounds or mixtures thereof;
3. metallic molybdenum, molybdenum compounds or mixtures thereof, and mixtures thereof by an ester exchange reaction.

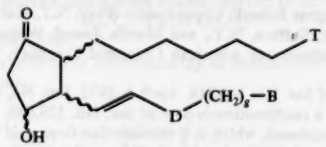
4,074,063

BICYCLOALKYL DERIVATIVES OF PROSTAGLANDINS

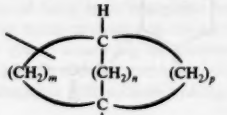
Warren Dexter Woessner; Charles John Sih; Harold Clinton Kluender; Henry Clifford Arndt, and William Gerard Biddlecom, all of Madison, Wis., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Feb. 11, 1976, Ser. No. 657,221
Int. Cl.[2] C07C *177/00*
U.S. Cl. 560—121 9 Claims

1. A compound having the formula



wherein
g is an integer having a value of from 0 to 10;
D is a R-hydroxymethylene or S-hydroxymethylene radical;
T is an alkoxycarbonyl having from 1 to 3 carbon atoms inclusive in the alkyl chain or carboxyl radical or pharmacologically acceptable nontoxic carboxy salts; and
B is a bicycloalkyl radical of the formula



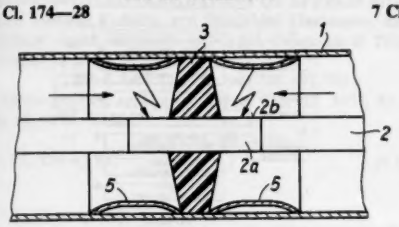
where m and p are integers having a value of from 1 to 4; n is an integer having a value of from 0 to 4 such that n is not 1 when m and p are both 2; and the sum of m, n and p is greater than or equal to 3 and where the point of attachment of the alkyl chain $(CH_2)_g$ to the bicycloalkyl radical is in the $(CH_2)_m$ bridge or bridgehead position.

ELECTRICAL

4,074,064
ENCAPSULATED, GAS-INSULATED HIGH-VOLTAGE APPARATUS HAVING INCREASED RESISTANCE TO ARC ACTIVITY

Kurt Müller; Friedrich Richter, and Heinz-Helmut Schramm, all of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 19, 1974, Ser. No. 525,228
Claims priority, application Germany, Nov. 29, 1973, 2360071
Int. Cl.² H01B 9/04
U.S. Cl. 174—28 **7 Claims**

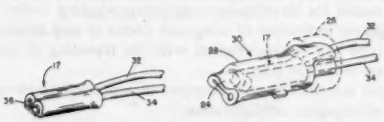


1. In a gas-insulated, high-voltage apparatus wherein arcs can develop, the apparatus including: a metal enclosure; at least one electrical conductor made of aluminum or an alloy thereof; and an insulator for holding said conductor in spaced relation to said metal enclosure; and, wherein the improvement comprises: a metal member arranged at said conductor at locations thereof subject to the greatest arc activity, said metal member having a surface of electrically conductive, arc-resistant material facing said metal enclosure, said material having a reaction enthalpy less than the reaction enthalpy required to cause a chemical reaction of the material of said conductor with the gas under the action of an arc forming during the operation of the apparatus.

4,074,065
INSULATED WIRE SPLICE

Harry Vincent Leaf, Marshfield, and Francis J. Cassidy, Brockton, both of Mass., assignors to Ark-Les Switch Corporation, Watertown, Mass.

Continuation-in-part of Ser. No. 600,208, July 30, 1975, Pat. No. 3,999,273. This application Mar. 22, 1976, Ser. No. 669,155
Int. Cl.² H01R 5/10
U.S. Cl. 174—87 **3 Claims**

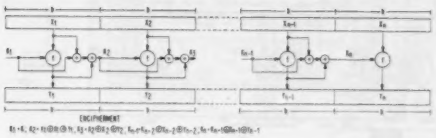


1. A post-insulated wire splice including
a conductive connector and an insulating member surrounding said connector,
said connector including a ferrule crimped around at least two wires, said ferrule having a generally smoothly curvd exterior surface and having outer and inner ends defined with respect to said wires, said wires extending externally beyond said ferrule inner end and being terminated adjacent said ferrule outer end,
said connector having a separation portion extending beyond said ferrule outer end, including an exterior surface continuous with a portion of said ferrule exterior surface and a sheared edge remote from said ferrule,
said separation portion being deformed from a shape coincident with a portion of the projection of said ferrule exterior surface to displace said sheared edge inwardly of said projection of said ferrule exterior surface toward said wires,
said insulating member comprising a generally tubular sleeve of insulating plastic material,
said insulating member fitting closely around said connector, and said connector sheared edge being spaced inwardly from said insulating member.

4,074,066
MESSAGE VERIFICATION AND TRANSMISSION ERROR DETECTION BY BLOCK CHAINING

William Friedrich Ehrsam, Hurley; Carl H. W. Meyer, Kingston; John Lynn Smith, and Walter Leonard Tuchman, both of Woodstock, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 26, 1976, Ser. No. 680,404
Int. Cl.² H04L 9/02
U.S. Cl. 178—22 **12 Claims**



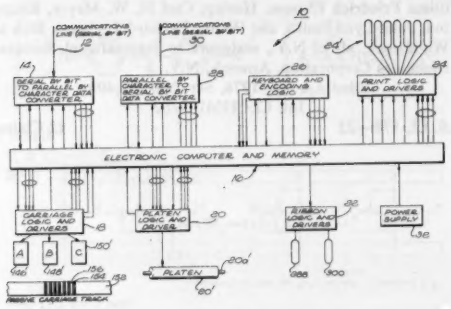
1. A system for the transmission of an input message consisting of successive input blocks of clear data bits from a sending station to a receiving station, comprising:
first cryptographic apparatus included in said sending station,
means applying said input message to said first cryptographic apparatus,
said first cryptographic apparatus operative in successive single cipher function operations for ciphering successive input blocks of clear data bits of said input message under control of successive input sets of cipher key bits to provide an output message consisting of successive output blocks of ciphered data bits corresponding to said successive input blocks of clear data bits for transmission to said receiving station,
means included in said first cryptographic apparatus providing one of said inputs for each succeeding single cipher function operation of said first cryptographic apparatus as a function of at least the preceding input block of clear data bits and the preceding output block of ciphered data bits of each preceding single cipher function operation so that each succeeding output block of ciphered data bits is effectively chained to all preceding single cipher function operations of said first cryptographic apparatus,
second cryptographic apparatus included in said receiving station receiving said output message transmmitted from said sending station as an input message consisting of successive input blocks of ciphered data bits and operative in successive single cipher function operations for deciphering successive input blocks of ciphered data bits under control of successive input sets of cipher key bits to provide a deciphered message consisting of successive output blocks of clear data bits corresponding to said successive input blocks of clear data bits of said input message of said sending station, and
means included in said second cryptographic apparatus providing one of said inputs for each succeeding single cipher function operation of said second cryptographic apparatus as a function of at least the preceding input block of ciphered data bits and the preceding deciphered output block of clear data bits of each preceding single cipher function operation so that each succeeding deciphered output block of clear data bits is effectively chained to all preceding single cipher function operations of said second cryptographic apparatus.

4,074,067

DIGITAL PRINTOUT ARRANGEMENT WITH MAGNETIC FIELD CARRIAGE DRIVE

Arthur Speckhard, 1617 Granvia Altamira, Palos Verdes Estates, Calif. 90274

Filed June 25, 1976, Ser. No. 699,623
Int. Cl.[2] B41J 5/30; H04L 15/00
U.S. Cl. 178—23 R 18 Claims



1. In a printout arrangement for providing a predetermined printout on a medium in response to a known first coded information signal, the improvement comprising, in combination:

a platen means for incremental, digital rotational movement adjacent said medium to move said medium in first directions;

platen drive means operatively connected to said platen means for selectively moving said platen in response to a platen control signal;

carriage means adjacent said medium for digital incremental reciprocating motion in second directions different from said first directions;

carriage drive means operatively connected to said carriage means for driving said carriage in said second directions in response to a carriage drive signal, and said carriage drive means comprising means for providing magnetic forces for interaction between said carriage drive means and said carriage to provide said digital incremental reciprocating motion thereof, and said carriage means being free of mechanical interconnection to said carriage drive means;

a print head means mounted on said carriage means for movement therewith, for printing predetermined sequential patterns on the medium;

print head control means operatively connected to said print head for controlling said predetermined sequential patterns of printing in response to a print control signal;

ribbon means mounted for digital, incremental movement intermediate said print head and said medium;

ribbon drive means operatively connected to said ribbon for selectively moving said ribbon in response to a ribbon control signal;

data converter means for receiving said first coded informaton signal and converting said first coded information signal to a second coded information signal different from said first coded information signal;

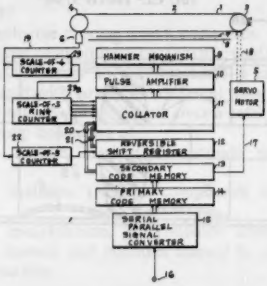
microprocessor means for receiving said second coded information signal and generating said platen control signal, said carriage control signal, said print control signal and said ribbon control signal in response to said second coded information signal in an interrelated predetermined timed sequence to provide said sequential patterns of printing in predetermined locations on said medium.

4,074,068

FLYING PRINTING SYSTEM USING TYPE BELT

Tasaku Wada, and Satoru Nakabo, both of Tokyo, Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed Aug. 13, 1976, Ser. No. 714,276
Claims priority, application Japan, Aug. 15, 1975, 50-99361
Int. Cl.[2] B41J 1/00; H04L 15/34
U.S. Cl. 178—23 R 4 Claims



1. A flying printing system comprising:

a type belt having thereon types at a type pitch M different from a predetermined print pitch N, the respective numbers d_1 and d_2 of said print pitches N and said type pitches M per unit length being an integral of said print pitch and being determined under a condition: $M = N \cdot d_1/d_2$, said types being arranged such that respective telegraph codes of the successively arranged types successively change in binary numbers;

drive means coupled to said type belt to drive said type belt at a travelling speed in a travelling direction;

print means including type hammers disposed opposite said type belt and arranged at a pitch corresponding to said print pitch N;

sense means coupled to said drive means to develop type clock pulses indicative of the travelling timing of said type belt;

first count-down means coupled to said sense means for counting down said type clock pusles to one-d_1th to develop first counted down pulses;

second count-down means coupled to said sense means for counting down said type clock pulses to one $_2$th to develop second counted down pulses;

first shift register means coupled to said second count-down means for developing type corresponding codes successively indicative of telegraph codes of said types on said type belt in synchronism with the traveling of said types on said type belt;

input terminal means receptive of input telegraph codes of serial signal configuration;

signal conversion means connected to said input terminal means for converting said input telegraph codes of serial signal configuration to parallel signal configuration;

primary code memory means connected to said signal conversion means for temporarily storing said converted telegraph codes of parallel signal configuration;

secondary code memory means operatively coupled to said primary code memory means for temporarily storing said converted telegraph codes of parallel signal configuration except function codes;

second shift register means coupled to said first count-down means and said secondary code memory for developing address codes to read out the telegraph codes of parallel signal configuration from the secondary code memory means;

collator means coupled to said first shift register and said secondary code memory for successively comparing each of said read out telegraph codes from the secondary code

memory with all of said type corresponding codes at the intervals d_1/d_2 times the time intervals of said type clock pulses; and

means connected to said collator means and said print means for driving a corresponding one of said type hammers when compared codes coincide with each other at the collator means.

4,074,069

METHOD AND APPARATUS FOR JUDGING VOICED AND UNVOICED CONDITIONS OF SPEECH SIGNAL

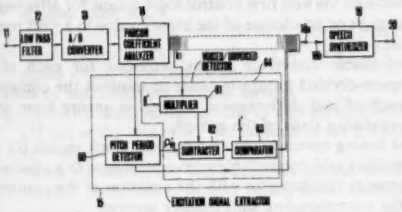
Yoichi Tokura, Kodaira, and Shinichiro Hashimoto, Koganei, both of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Japan

Filed June 1, 1976, Ser. No. 691,780

Claims priority, application Japan, June 18, 1975, 50-73063; July 15, 1975, 50-86277

Int. Cl.² G10L *1/00*

U.S. Cl. 179—1 SC **24 Claims**



1. A method of judging voiced and unvoiced conditions of a speech signal, comprising the steps of determining a ratio $\phi(\tau s)/\phi(o)$ between the value $\phi(o)$ of the autocorrelation function of a speech signal at a zero delay time, and the value $\phi(\tau s)$ of the autocorrelation function at a delay time τs of a sampling period, and combining said ratio with a parameter extracted from the speech signal by correlation technique and representing the degree of the periodicity of the speech signal thereby judging that the speech signal is in a voiced condition or an unvoiced condition.

4,074,070

SUPERSONIC SIGNAL LINEARIZES LOUDSPEAKER OPERATION

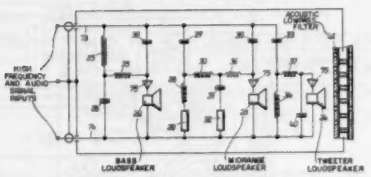
Harry Gaus, Kronberg, Taunus, Germany, assignor to Braun A.G., Frankfurt, Germany

Filed Sept. 29, 1975, Ser. No. 617,825

Claims priority, application Germany, Oct. 2, 1974, 2446982

Int. Cl.² H04R *3/04, 3/14*

U.S. Cl. 179—1 D **11 Claims**



1. A process for minimizing audio distortions in electrodynamic loudspeaker apparatus having first, second, and third loudspeaker systems each having a driving system including a diaphragm connected to a coil moving in response to electrical signals, which comprises:

superimposing a high frequency oscillation signal on a low frequency audio signal coupled to said movable coils;

vibrating said diaphragms in response to said high frequency oscillation signal and said low frequency audio signal; and

providing minimum damping of said high frequency signal coupled to said driving system of said first and second loudspeaker systems, and an increase in damping for signals at frequencies above an auditory frequency range coupled to said driving system of said third loudspeaker system.

4,074,071

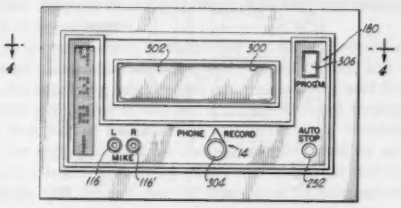
AUTOMATIC TELEPHONE ANSWERING DEVICE WITH PAIRED TRANSDUCERS

Robert Shragal, Bellwood, Ill., assignor to Wells-Gardner Electronics Corporation, Chicago, Ill.

Filed Apr. 2, 1976, Ser. No. 672,864

Int. Cl.² H04M *1/64;* G11B *21/08*

U.S. Cl. 179—6 R **21 Claims**



1. A telephone answering device comprising:

first and second transducers movably affixed within said telephone answering device;

means for transporting a single closed loop record medium having multiple pairs of recording tracks across each of said first and second transducers; and

means electrically coupled to said first and second transducers for rendering said first transducer operative to play back signals recorded on one of the tracks of one of said pairs and for simultaneously rendering said second transducer operative to record signals on the other track of said one pair, wherein said device further includes means mechanically coupled to said first and second transducers for simultaneously realigning said transducers with different pairs of said tracks, said realigning means being operative to realign said transducers with a different pair of said tracks upon the recording of one telephone call.

12. The method of automatically answering a telephone comprising the steps of:

recording multiple answering messages on one half of the tracks of a multiple track record medium;

playing back one of the answering messages into the telephone line upon receipt of an incoming telephone call;

recording the incoming telephone call on another track of the same record medium associated with the played back answering message; and

playing back a second one of the answering messages from a second track into the telephone line upon receipt of a subsequent telephone call.

4,074,072

MULTIPROCESSOR CONTROL OF A PARTITIONED SWITCHING NETWORK BY CONTROL COMMUNICATION THROUGH THE NETWORK

Carl Christensen, Berkeley Heights; Arthur Dickson Hause, Watchung, and Henry Stanton McDonald, Summit, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 24, 1976, Ser. No. 689,510

Int. Cl.² H04Q *11/04*

U.S. Cl. 179—15 AQ **23 Claims**

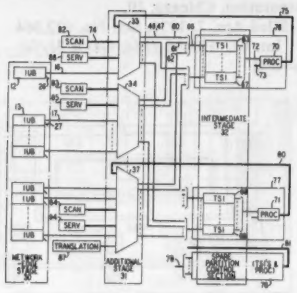
1. In a switching network for selectively establishing interconnections between signal communication ports at the edge of the network,

a plurality of stages in said network, one of said stages being divided into plural signal path switching blocks,

a plurality of signal processors equal in number to the number of said blocks of said one stage, and

means for coupling each of said processors to a different corresponding block of said one stage for controlling through said coupling means call path coupling both through that block and through a predetermined portion of each of the other stages of said network coupled between such block and an edge of said network.

5. The network in accordance with claim 1 in which said network is a time division multiplex switching network with



reconfigurable call path interconnections in plural time slots of recurring time frames, and said one stage is an intermediate stage and includes

at least one time slot interchanging means in each of said intermediate stage blocks,

means for coupling said interchanging means to be controlled from said processor which is coupled to such block, and

means for coupling signals between the last mentioned processor and said plurality of stages through said interchanging means.

4,074,073

PILOT RECEIVER MEMORY UNIT IN A CARRIER FREQUENCY SYSTEM

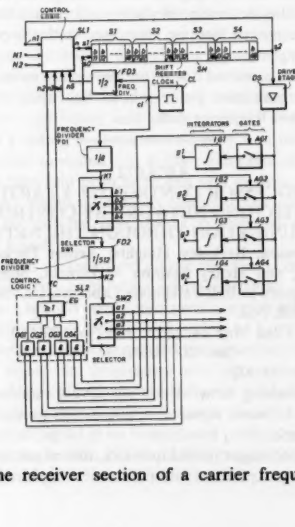
Arne Eidsmo, Tyreso, and Bengt Gustav Löfmark, Skarholmen, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Mar. 19, 1976, Ser. No. 668,429

Claims priority, application Sweden, Apr. 4, 1975, 7503881

Int. Cl.² H04J *1/16*

U.S. Cl. 179—15 BP **4 Claims**



1. In the receiver section of a carrier frequency system utilizing pilot signals for space-divided frequency groups having a receiver with receiver paths for each of the groups, a regulating unit in each of the receiver paths, and a memory unit, the receiver delivering determination signals for each of said groups to the memory unit in dependence on the value of the pilot signal associated with the group, the determination signals indicating the level of the pilot signal of the group in relation to a nominal level in order to determine a value to be stored in the memory unit, and the value being supplied as a control value to the regulating unit in the receiver path of the group, the improvement comprising:

a multi-section digital shift register with a section being provided for each of the space-divided group, the binary value stored in each section representing a control value for a specific group,

first control logic means for either changing at least one binary value to its complementary value or maintaining the binary value unchanged in dependence on the determination signals upon receipt of an activating signal,

clock means for circulating the contents of the shift register sections via said first control logic means for effecting the change or no change of the binary value in a shift register section,

controllable converter means provided for each of the space-divided groups in order to transmit the contents of each of said shift register sections in analog form to the regulating units of the groups,

first timing means controlled by said clock means for controlling said controllable converter means to a conducting state in synchronism with the emission of the contents of the corresponding shift register section,

second timing means controlled by said clock means for delivering control pulses to the receiving path of each space-divided group in order to feed the associated group pilot signal to the receiver, and

second control logic means for transmitting an activating signal to said first control logic means during the emission of the binary contents of a certain shift register section simultaneously with the control pulse from said second timing means which belongs to the frequency group associated with said certain shift register section.

4,074,074

TIME DIVISION DIGITAL TRANSMISSION SYSTEM

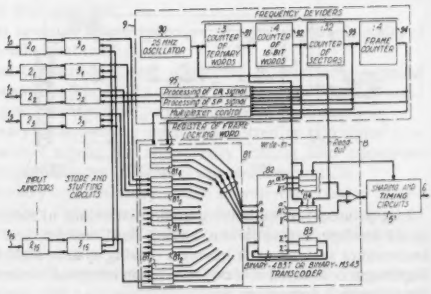
Patrick E. Boutmy, and Jean G. Walraet, both of Lannion, France, assignors to Societe Anonyme de Telecommunications, Paris Cedex, France

Filed Apr. 15, 1977, Ser. No. 788,040

Claims priority, application France, Apr. 23, 1976, 76 12129

Int. Cl.² H04J *3/04*

U.S. Cl. 179—15 BW **7 Claims**



1. A time-division digital transmission system comprising transmitting and recieving stations and transmission lines interconnecting said respective stations using a binary code in said stations and a multi-level code in said transmission lines in

which a number of component digital channels having a low flow rate are multiplexed into a single resultant channel having a high flow rate, said multi-level code being such that a number N of bits in said binary code in the transmitting and receiving stations corresponds to a smaller number N′ of digits of the multi-level code whereby a predetermined flow rate in said stations corresponds to a smaller flow rate in said transmission lines which is equal to N′/N times said predetermined flow rate in said stations, said time-division digital transmission system comprising:

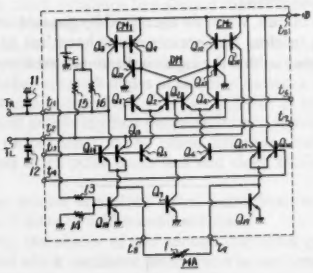
1. each of said transmitting stations having:
   a. means for placing in parallel the bits of a number of said component digital channels equal to an integral multiple k of N at the rate of one bit per component digital channel so as to form parallel words of kN bits;
   b. means for multiplexing the bits of said parallel kN-bit words into k parallel words of N bits;
   c. means for converting said parallel N-bit words from said binary code used in said stations into parallel words of N′ digits in said multi-level code used in said transmission lines; and
   d. the multiplexing and code conversion being practically simultaneous without producing a binary multiplex signal which is serialized; and
2. each of said receiving stations having:
   a. means for distributing the bits of said parallel words of kN bits at the rate of one bit on each of the kN component digital channels;
   b. means for converting said parallel N′-digital words into parallel N-bit words of said binary code used in said stations;
   c. means for forming parallel words of kN bits out of the number of k of N-bit words supplied by converting means in said receiving part; and
   d. means for multiplexing said parallel kN-bit words into kN bits at the rate of one bit per component digital channel.

4,074,075

CIRCUIT FOR DEMODULATING A STEREO SIGNAL

Mitsuo Ohsawa, Fujisawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 28, 1976, Ser. No. 736,306
Claims priority, application Japan, Oct. 30, 1975, 50-130917
Int. Cl.[2] H04H *5/00*
U.S. Cl. 179—15 BT **8 Claims**



1. A stereo demodulating circuit for demodulating a composite stereo signal to produce signals representing information contained in individual channels of the composite stereo signal, comprising:

switching means supplied with said composite stereo signal including a main-channel (L+R) signal, a sub-channel (L−R) signal modulated onto a sub-carrier, and a sub-carrier switching signal, said switching means producing oppositely phased sub-channel signals (L−R) and −(L−R), respectively;

first and second current generating means coupled to said switching means for producing first and second currents proportional to said oppositely phased sub-channel signals (L−R) and −(L−R), respectively;

an amplifier supplied with said composite stereo signal for amplifying said main-channel (L+R) signal, said amplifier including a first pair of transistors connected as differential amplifier type switching circuits to first and second current sources, respectively, and a second pair of transistors connected as differential amplifier type switching circuits to said first and second current sources, respectively;

channel separation control means interconnected between said first and second current sources for adjustably varying the currents flowing through said first and second pairs of transistors;

first and second output terminals for producing individual channel information signals L and R, respectively; and

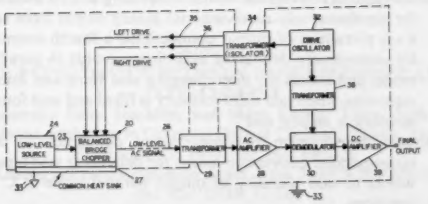
means for supplying said first current produced by said first current generating means and a current flowing through said first pair of transistors to said first output terminal, and for supplying said second current produced by said second current generating means and a current flowing through said second pair of transistors to said second output terminal.

4,074,076

CHOPPER-MULTIPLEXER SYSTEM FOR MEASUREMENT OF REMOTE LOW-LEVEL SIGNALS

Donald R. Zrudsky, Sylvania, Ohio, assignor to The University of Toledo, Toledo, Ohio

Division of Ser. No. 546,700, Feb. 3, 1975, Pat. No. 3,995,174, which is a continuation-in-part of Ser. No. 445,929, Feb. 26, 1974, abandoned. This application Sept. 7, 1976, Ser. No. 720,552
Int. Cl.[2] H04J *3/04*
U.S. Cl. 179—15 BL **9 Claims**

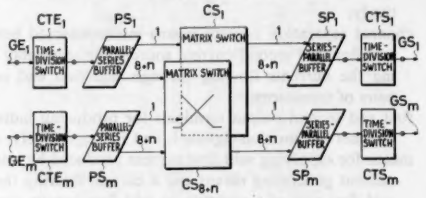


1. A system comprising, in combination, a reference grounded receiver, a plurality of remote low-level signal sources each adjacent a local ground, a plurality of balance bridge chopper means, one located adjacent and connected to each remote source for modulating at a predetermined frequency the low-level signals from such source when such chopper means is driven by a signal having such frequency, transmission line means for connecting the modulated low-level signal outputs from said chopper means in parallel to said receiver, and means for selectively driving at such predetermined frequency one of said chopper means at a time whereby only the low-level signal from the source connected to the driven chopper means is modulated and applied to said receiver.

4,074,077
TST EXCHANGE WITH SERIES-MODE SPACE SWITCHING STAGE

Pierre Charransol; Jacques Hauri, and Claude Athenes, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 10, 1976, Ser. No. 684,964
Claims priority, application France, May 13, 1975, 75 14875
Int. Cl.[2] H04J *3/00*
U.S. Cl. 179—15 AT 4 Claims



1. A time-division exchange for switching binary words of k bits from a plurality of incoming parallel-mode P C M junctions to a plurality of output parallel-mode P C M junctions, said exchange comprising:

first time-division switching means connected to said incoming P C M junctions for delivering said binary words in parallel-mode;

parallel-series conversion means comprising a first memory for successively receiving said binary words from said first time-division switching means, a second memory for simultaneously delivering said binary words in series mode on respectively k+n pluralities of input connections, and means for interchanging said first and second memories when said first memory is filled and said second memory is empty;

matrix switching means connected to said $k+n$ pluralities of input connections for delivering said binary words in series mode on $k+n$ pluralities of output connections; said matrix switching means being divided into $k+n$ independant distinct elements, each of said elements being connected respectively to one of said pluralities of input connections and to one of said pluralities of output connections and presenting to said binary words a plurality of paths between said input connections and said output connections;

series-parallel conversion means comprising a third memory for simultaneously receiving said binary words from said $k+n$ pluralities of output connections, a fourth memory for successively delivering said binary words in parallel-mode, and means for interchanging said third and fourth memories when said third memory is filled and said fourth memory is empty; and

second time-division switching means connected to said series-parallel conversion means for delivering said binary words to said plurality of output parallel-mode P C M junctions.

4,074,078
TELEPHONE PRIVACY DEVICE

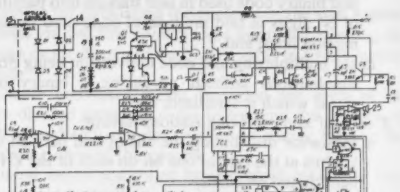
Bernard L. Jansen, Denver, Colo., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Mar. 17, 1975, Ser. No. 558,726
Int. Cl.[2] H04M *1/64*
U.S. Cl. 179—84 C 2 Claims

1. A privacy circuit adaptable for installation to the incoming lines of a called telephone connected through a conventional telephone exchange which signals an incoming call only if the calling party generates an audible recognition signal through the mouthpiece of the calling telephone, said device inhibiting the sounding of the conventional bell of the attached called telephone for all incoming calls, without requiring detachment of the circuity of said bell,

said privacy circuit comprising a first circuit connected to the incoming lines of the called telephone, said first circuit including electronic means to sense and to inhibit an incoming ringing signal and prevent ringing of the attached bell of the called telephone,

said electronic means of said first circuit including electronic circuit means to immediately reduce the voltage across the incoming called telephone line so as to simulate the answering of the called telephone, upon sensing an incoming ringing signal and before the bell of the called telephone can be actuated by the ringing signal, with said reduction of voltage across the line of the called telephone causing the central telephone exchange to discontinue the ringing signal prior to actuation of the attached bell of the called telephone, and



a timer circuit which holds said first circuit in the sensed condition for a pre-set period of time after the first circuit inhibits the ringing signal,

a first oscillator circuit at the called telephone which sends a signal recognizable as an audible tone to the receiver of the calling telephone,

a recognition circuit at the called telephone which is responsive to the receipt of said tone signal generated by the calling party having a specific frequency and specific time duration, for energizing a second oscillator circuit to generate an audible signal through an attached first loudspeaker at the called telephone, said second oscillator circuit controlled by the said timer to remain operative for a pre-set period,

said first circuit, when de-energized by the said timer circuit acting to clear the incoming telephone line of the called telephone so that the caller is disconnected from the called line.

4,074,079
COIN TELEPHONE ANTIFRAUD SYSTEM

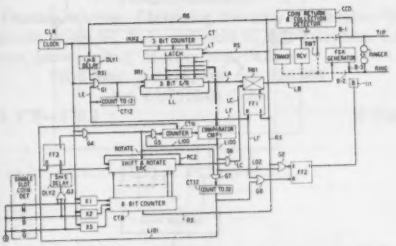
Edward Myron Prell, St. Charles, and Barry William Rogers, Geneva, both of Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 2, 1976, Ser. No. 692,208
Int. Cl.[2] H04M *17/00*
U.S. Cl. 179—6.3 R 11 Claims

1. In a coin station,

choosing means for choosing one of a plurality of coding algorithms,

transmitting means for transmitting the identity of the chosen algorithm to the serving telephone office, and



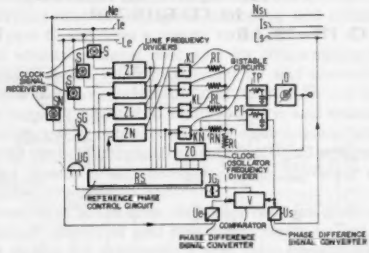
coding means for coding coin deposit information in accordance with said chosen algorithm.

4,074,080

METHOD AND SWITCHING ARRANGEMENT FOR SYNCHRONIZING OSCILLATORS OF A DIGITAL TELECOMMUNICATION NETWORK

Alexander Dragotinov, Munich, and Harro Lothar Hartmann, Braunschweig, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed May 28, 1976, Ser. No. 691,137
Claims priority, application Germany, May 28, 1975, 2523734
Int. Cl.[2] H04L *7/00*
U.S. Cl. 178—69.1 **8 Claims**



1. A method of synchronizing clock oscillators in the network nodes of a first digital communication network utilizing at least one clock oscillator in a second digital communication network, comprising the steps of:

comparing, in each network node, the phases of first line clock pulse trains on incoming lines to that network node from other network nodes in said first network with clock pulse trains issuing from a clock oscillator in the network node and producing first phase difference signals having a value proportional to the phase difference between said first line clock pulse trains and said clock oscillator pulse trains,

receiving second line clock pulse trains from at least one network node of said second network,

comparing the phases of said second line clock pulse trains and said clock oscillator pulse trains in the network node and producing a second phase difference signal having a value proportional to the result of the comparison,

receiving from another network node in said first network a third phase difference signal produced in the other network node in like manner as said second phase difference signal,

generating a comparison output signal whenever the value of said second phase difference signal exceeds the value of said third phase difference signal,

suppressing a number of pulses in said second line clock pulse train in proportion to the value of said compression output signal and sufficient to reduce the value of said second phase difference signal to be equal to or less than said third phase difference signal,

producing a control signal which is one of the sum or average of said first and second phase difference signals and

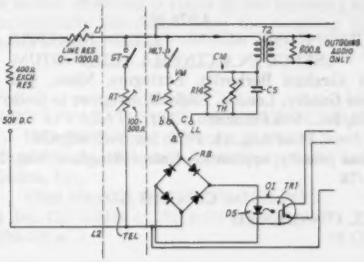
regulating the frequency of said clock oscillator responsive to the value of said control signal.

4,074,081

APPARATUS FOR DETECTING THE LEVEL OF DIRECT CURRENT OR VOLTAGE ON A TELEPHONE LINE

Arthur James Humm, Farnborough, England, assignor to Ansafone Limited, London, England

Filed Apr. 8, 1976, Ser. No. 674,945
Claims priority, application United Kingdom, Apr. 10, 1975, 14882/75
Int. Cl.[2] H04M *1/00*
U.S. Cl. 179—84 R **16 Claims**



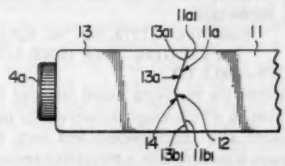
1. An apparatus for detecting the level of a direct current or voltage on a telephone line having two conductors, comprising optical isolator means wherein a first semiconductor device is adapted to emit electromagnetic radiation whose intensity represents the level of current flowing through the device and a second semiconductor device is arranged to receive radiation emitted from the first device and to generate a current whose level represents the intensity of the radiation, means for connecting the first device in the isolator means between the two conductors of the telephone line, and means for sensing only the direct current flowing through the second device in the isolator means and generating an output signal representative of the level of that direct current, and hence representative of the level of the direct current or voltage on the line.

4,074,082

COUPLING DEVICE BETWEEN TAPE RECORDER AND ATTACHMENT

Masanobu Sato, Hachioji, and Shiro Kondo, Tama, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 27, 1976, Ser. No. 690,529
Claims priority, application Japan, June 5, 1975, 50-76107[U]
Int. Cl.[2] G11B *31/00*
U.S. Cl. 179—100.11 **6 Claims**



1. A coupling device between a tape recorder and an attachment therefore comprising a mating surface on the tape recorder on which a plurality of electrical connecting terminals

are provided for connecting an electrical circuit of an tape recorder with the electrical circuit of the attachment, a mating surface on the attachment adapted to be detachably coupled with a mating surface on the tape recorder, the mating surface on the attachment being provided with a plurality of electrical connecting terminals which are located thereon in a manner corresponding to the position of a plurality of terminals provided on the mating surface of the tape recorder, said pair of mating surfaces comprising respective, abutting whole edges of the tape recorder and the attachment, said mating surfaces each having a common ridge that runs along the length of the respective mating surfaces, wherein said mating surfaces have a pair of inclined surfaces in obtuse angle around their common ridge, respectively; in a manner of complementing with each other, to form a projecting engaging portion and a recessed engaging portion on the respective mating surfaces.

4,074,083

STEREOPHONIC SOUND SYSTEM PARTICULARLY USEFUL IN A CINEMA AUDITORIUM

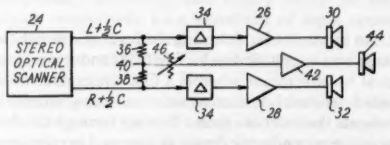
Robert Abraham Berkovitz, Lexington, Mass., and Kenneth James Gundry, London, England, assignors to Dolby Laboratories, Inc., San Francisco, Calif.

Filed Aug. 11, 1975, Ser. No. 603,670

Claims priority, application United Kingdom, Aug. 29, 1974, 37897/74

Int. Cl.[2] G11B 7/00

U.S. Cl. 179—100.1 TD **6 Claims**



1. A stereophonic sound reproducing system comprising two inputs for left and right channel signals, left and right amplifying channels and loudspeakers connected to the respective inputs, means for summing the signals from the two inputs, and a center amplifying channel and loudspeakers connected to receive the summed signals, wherein each of the left and right amplifying channels includes sufficient delay to establish a precedence effect for the center channel loudspeaker, and the level of sound provided by the center channel loudspeaker is sufficiently less than that provided by the left and right channel loudspeakers for the latter to establish a stereo image when the left and right channel signals differ.

4,074,084

METHOD AND APPARATUS FOR RECEIVING SOUND INTENDED FOR STEREOPHONIC REPRODUCTION

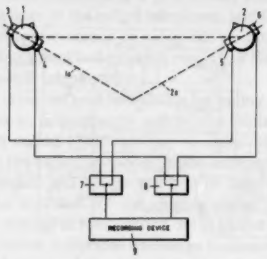
Johannes Cornelis Maria van den Berg, Kleibroek 14, Castricum, Netherlands

Filed Nov. 5, 1975, Ser. No. 629,049

Int. Cl.[2] G11B 23/18; H04R 5/00

U.S. Cl. 179—100.1 TD **5 Claims**

1. A method for receiving sound intended for stereophonic reproduction, in which sound is received by means of a plurality of spaced apart microphones and each signal from said microphones is recorded on a respective recording medium or on different parts of a single recording medium, or signals from said microphones are used for immediate re-transmission, characterized in that the reception is performed by means of at least two spaced apart microphone pairs of the dummy heads type, said microphone pairs being coupled to each other so that signals collected by microphones located on similar sides of



said dummy heads are essentially added to each other and are substantially recorded or used for immediate re-transmission.

4,074,085

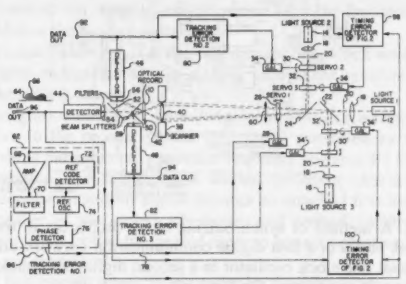
MULTIPLE BEAM OPTICAL RECORD PLAYBACK APPARATUS FOR SIMULTANEOUS SCAN OF PLURAL DATA TRACKS

James T. Russell, Richland, Wash., assignor to Eli S. Jacobs, New York, N.Y.

Filed Mar. 31, 1976, Ser. No. 672,458

Int. Cl.[2] G11B 7/00

U.S. Cl. 179—100.3 B **17 Claims**



1. A multiple beam optical record playback apparatus comprising:

an optical record having at least two optical data tracks recorded thereon each including a plurality of optical data spots;

beam forming means for producing at least two light beams;

scanning means for scanning each of said two light beams along a different one of said two data tracks to modulate said light beams by moving them across the optical data spots thereon;

first detector means for detecting the modulated first light beam and producing a corresponding first electrical output signal;

second detector means for detecting the modulated second light beam and producing a corresponding second electrical output signal;

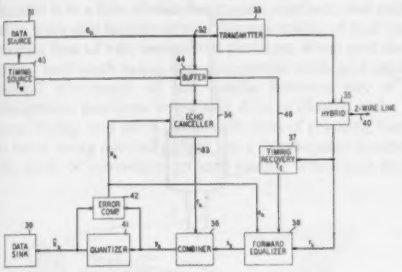
first optical servo means connected to the output of the first detector, for deflecting both of said two light beams laterally to said two data tracks; and

second optical servo means connected to the output of the second detector for adjusting the lateral spacing between said two light beams.

4,074,086
JOINT ADAPTIVE ECHO CANCELLER AND EQUALIZER FOR TWO-WIRE FULL-DUPLEX DATA TRANSMISSION

David Duncan Falconer, Linkoping, Sweden, and Stephen Brant Weinstein, Holmdel, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 7, 1976, Ser. No. 720,999
Int. Cl.[2] H04B 3/24
U.S. Cl. 179—170.2 **10 Claims**



1. A joint echo cancellation and forward equalization arrangement for a digital data transmission system having both a transmitter section and a receiver section for simultaneous two-way signaling a full bandwidth over a common signal path comprising at each such terminal,

a first adjustable signal processor in said receiver section for producing an output signal compensated for intersymbol interference inherent in signals traversing said common signal path to and from a remote terminal,

a second adjustable signal processor for compensating for echoes of signals being transmitted by said transmitter section which have leaked into said receiver section having an output connected to a data source in said transmitter section and an output connected in sutractive relationship with the output signal from said first signal processor,

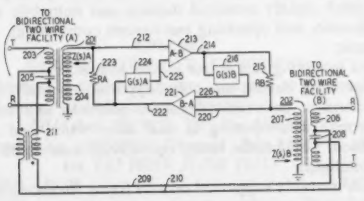
combining means in said receiver section providing said subtractive relationship, and

means responsive to the error difference between quantized and actual outputs of said combining means in said receiver section for generating a joint error control signal for said first and second signal processors.

4,074,087
BIDIRECTIONAL VOICE FREQUENCY REPEATER

Roy Baxter Blake, Jr., Jamestown; James deGoulard Gwatkin, III; Judy Pat Magee, both of Greensboro, and Glendon Russell Porter, Greensboro, all of N.C., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 16, 1976, Ser. No. 714,306
Int. Cl.[2] H04B 3/20, 1/58, 3/36
U.S. Cl. 179—170.2 **17 Claims**



1. A signal transmission network which comprises:

transformer means having a primary and a secondary, said primary being adapted to couple the transmission network to a 2-wire transmission facility and said secondary having first and second terminals, said first terminal being connected to a reference potential;

amplifier means having first and second inputs and an output and being arranged to amplify outgoing signals, said first input being connected in circuit with said second terminal of said transformer means secondary;

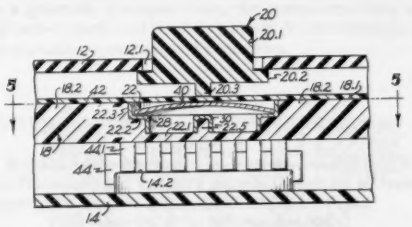
means connected in circuit relationship with said second terminal of said transformer means secondary for supplying incoming signals to said transmission network; and

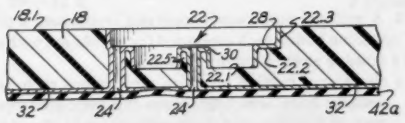
means connected in circuit between said incoming signal supplying means and said second input of said amplifier means and having a prescribed complex transfer characteristic for generating a signal which is substantially a replica of an error signal developed across said transformer means secondary in response to said incoming signals because of complex impedance components of the 2-wire transmission facility when connected to said transformer means primary, wherein said replica signal and said error signal are algebraically combined by said amplifier means substantially to effect cancellation of said error signal so that unwanted portions of said incoming signals are substantially eliminated from the outgoing signals from said amplifier means.

4,074,088
KEYBOARD APPARATUS AND METHOD OF MAKING

Laurence J. Keough, Walpole, and Bruce D. Butts, North Easton, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 21, 1974, Ser. No. 471,943
Int. Cl.[2] H01H 13/70, 9/00; H05K 1/16
U.S. Cl. 200—5 A **14 Claims**





12. A switch arrangement comprising:

a molded plastic board with a pattern of recesses molded into one surface and a hole extending through the board in the central region of each recess;

a pattern of conductive material on said board, said pattern comprising through-plating in each said hole, a patch of said material placed centrally in the bottom of said recess and connected to said through-plating, and a portion around the periphery of said recess in its bottom and extending up the wall and over the lip of the recess; and

a dome in each recess, the rim of said dome being in contact with said peripheral portion, and the peak of said dome being poised above said central patch when undeflected, and being deflectable into contact with said patch.

13. A keyboard apparatus comprising a dielectric card having a plurality of recesses in one card side, first electrically conductive contacts disposed in respective card recesses, complementary electrically conductive contacts disposed in re-

spective card recesses in spaced relation to the first contacts within said recesses, a selected pattern of circuit path means on said card connected to said contacts, and a plurality of electrically conductive elements each having a dished configuration movable with snap-action to an inverted dished configuration in response to pressure applied thereto, said snap-acting elements being disposed in an open circuit position in said respective card recesses in engagement with one of said contacts in said recesses and spaced from another of said contacts in said recesses, said respective snap-acting elements being adapted to be pressed toward said inverted dished configuration to additionally engage another of said contacts in said recesses for closing a circuit.

4,074,089

MULTIPLE PUSH-SWITCH APPARATUS HAVING FLEXIBLE ELEMENT PREVENTING SIMULTANEOUS ACTUATOR DEPRESSION

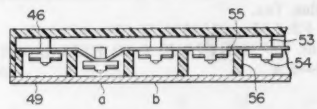
Itaru Mitsugi, Kadoma, and Toshio Hayakawa, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

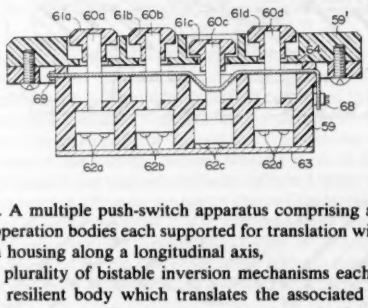
Filed May 24, 1976, Ser. No. 689,076

Claims priority, application Japan, May 28, 1975, 50-64487; June 10, 1975, 50-79268[U]; Mar. 17, 1976, 51-32469[U]

Int. Cl.[2] H01H *9/26*

U.S. Cl. 200—5 E **8 Claims**





1. A multiple push-switch apparatus comprising a plurality of operation bodies each supported for translation with respect to a housing along a longitudinal axis,

a plurality of bistable inversion mechanisms each having a resilient body which translates the associated operation body in one direction along said axis, each of said bistable inversion mechanisms being inverted by the resilient force of said resilient body when the operation body associated with the bistable inversion mechanism is depressed in the opposite direction along said axis to oppose the resilient force of said resilient body,

a plurality of switching mechanisms each closing when the associated bistable inversion mechanism is inverted, and

an elongated flexible element loosely attached to said operation bodies, both ends of said flexible element being fixed such that said element is strained with a predetermined amount of slackness, wherein,

when any one of said operation bodies is depressed the bistable inversion mechanism associated with said depressed operation body is inverted and another bistable inversion mechanism, which was in its inverted state before depression of said one of said operation bodies, is restored as said flexible member is strained by the depression of said one operation body.

4,074,090

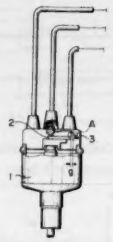
DISTRIBUTOR ROTOR ELECTRODE HAVING SILICON COATING FOR SUPPRESSING PEAKS OF CAPACITY DISCHARGE CURRENT

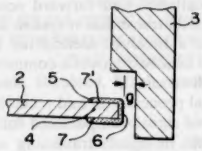
Minoru Hayashi, Toyota; Mineo Ogino, Aichi; Toshihiko Kobayashi, Toyoake, and Masaki Noda, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed May 7, 1976, Ser. No. 684,361

Int. Cl.[2] H01H *19/00, 1/02*

U.S. Cl. 200—19 DR **4 Claims**





1. In a distributor having a rotor brush with a discharge electrode portion adapted to rotate in association with a driving rotory shaft of an internal combustion engine and side terminals arranged adjacent to a locus of rotation of the rotor brush with a discharge gap provided therebetween, the improvement comprising a noise wave suppressing ion-plating formed silicon coating disposed on the surface of the discharge electrode portion of the rotor brush to suppress the peaks of capacity discharge current.

4,074,091

INTERLOCKING OPERATING MECHANISM FOR ENCLOSED SWITCHGEAR HAVING DEFEATER INTERLOCK

John F. Bischof, Richfield, and Ronald J. Fritsch, Sussex, both of Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Apr. 12, 1976, Ser. No. 676,332

Int. Cl.[2] H01H *9/20*

U.S. Cl. 200—50 A **24 Claims**

1. An operating mechanism for switchgear mounted in an enclosure having an openable door with an opening therein and a catch rigidly mounted thereon and immobile with respect thereto, said operating mechanism comprising:

a frame;

means mounting said frame in said enclosure;

an operating handle movably supported on said frame for movement between designated positions and extending through said opening in said door when said door is closed, said handle being operatively connected to said switchgear;

a latch movably supported on said frame for movement in a single plane and cooperable with said catch to prevent opening of said door when said handle is in a first of said designated positions, and cooperable with said handle to prevent movement of said handle to said first of said designated positions when said door is open.

15. An operating mechanism for switchgear mounted in an

enclosure having an openable door with an opening therein and a catch thereon, said operating mechanism comprising:

a frame;

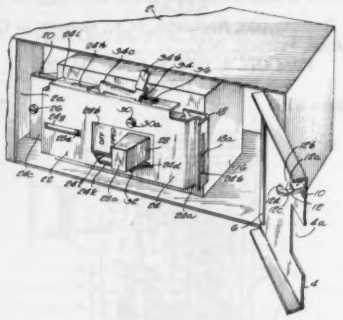
means mounting said frame in said enclosure;

an operating handle movably supported on said frame for movement between designated positions and extending through said opening in said door when said door is closed, said handle being operatively connected to said switchgear;

a latch pivotally mounted to said frame and cooperable with said catch to prevent opening of said door when said handle is in a first of said designated positions, and cooperable with said handle to prevent movement of said handle to said first of said designated positions when said door is open, said latch being also cooperable with said catch to permit movement of said handle between any of said designated positions when said door is closed; and

means biasing said latch in one direction of pivoting thereof;

said latch being normally biased to a first angular position in the path of movement of said handle when said door is



open to provide a stop against movement of said handle to said first designated position;

said catch holding said latch in a second angular position against the bias of said biasing means and out of the path of movement of said handle when said door is closed to permit movement of said handle between any of said designated positions;

said latch lying in the path of movement of said catch when said handle is in said first designated position to provide a stop against opening of said door;

said handle holding said latch in a third angular position against the bias of said biasing means and out of the path of movement of said catch when said handle is in a second of said designated positions to permit opening of said door;

said latch having a trunk portion cooperable with said handle and an arm portion cooperable with said catch, the path of movement of said handle intersecting the pivotal arc of said trunk porton, and the path of movement of said catch intersecting the pivotal arc of said arm portion.

4,074,092

SAFETY POWER TRACK SYSTEM

Laszlo Csenky, Budapest, Hungary, assignor to Szarvasi Vas-Femipari Szovetkezet, Szarvas, Hungary

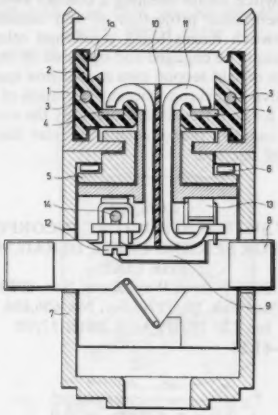
Filed Jan. 12, 1976, Ser. No. 648,364

Claims priority, application Hungary, July 16, 1975, 2818

Int. Cl.[2] H01R *19/50, 19/52*

U.S. Cl. 200—51.07 **4 Claims**

1. A safety power track system for carrying light fixtures, including a light source, comprising a generally U-shaped supporting rail, the limbs of which have inwardly bent ends, an internal insulating lining fitted in the rail and having at least a first current conductor embedded therein, earthing means connected to the bent ends of the limbs of the rail, and at least a second current conductor mounted in or on an externally substantially inaccessible portion of the lining that faces inwardly of the rail, a transversely mounted, reciprocally movable push-button switch having "on" and "off" positions and being formed with an oblique groove, a presser cam being guided for movement in said groove, at least two contactors engaged by the cam in the "on" position, conductor springs for



making contact with said cam, a conductive fixing screw for establishing contact of said springs and said cam, and a third conductor disposed in the interior of the adaptor and connected to one of the contactors, wherein each of said contactors is a generally C-shaped body, the contactors being arranged back-to-back, and insulating means for surrounding, as well as mutually separating said contactors.

4,074,093

SWITCHING MECHANISM IN AN ELECTRONIC WATCH

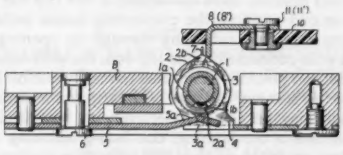
Yukio Ikehata, Matsudo; Masataka Ikenishi, Soka; Shozo Kushida, Narashino, and Tadahiro Kikuchi, Tokyo, all of Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Sept. 19, 1975, Ser. No. 614,958

Claims priority, application Japan, Sept. 24, 1974, 49-109814

Int. Cl.[2] H01H *3/32;* **G04C** *3/00*

U.S. Cl. 200—52 R **2 Claims**



1. A switching mechanism in an electronic timepiece comprising:

a. a rod mounted for axial rotation and having a peripheral notch extending peripherally thereof for a certain angular interval;

b. mounting means mounting said rod for axial rotation;

c. a first cam mounted for rotation on said rod and having a projection opposite the peripheral notch of said rod for engaging therewith to rotate with said rod and having dimensions less than said peripheral notch to allow said first cam to rotate on said rod relative thereto, and having an eccentric peripheral portion;

d. a resilient spring-like member having a free end positioned to bear against the periphery of said first cam as said first cam rotates upon rotation of said rod, said eccentric pe-

ripheral portion engaging said free end as said first cam is rotated relative thereto and bending said spring-like member and the bent spring-like member bearing against said eccentric peripheral portion to accelerate said first cam relative to said rod as said eccentric peripheral portion rotates past the free end of said spring-like member;

e. a second cam mounted for rotating concurrently with said first cam and having a peripheral projection; and

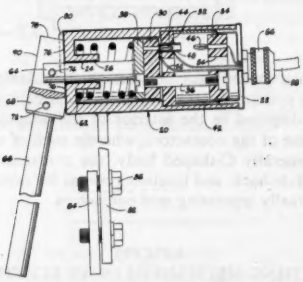
f. contact switch means defining a contact switch operated by the peripheral projection of said second cam, said contact switch means being positioned relative to said second cam to be engaged and operated by the peripheral projection of said second cam as said first cam is accelerated relative to said rod whereby operation of said contact switch is for an interval determined by the acceleration of said first cam to a rate of rotation greater than the rate of rotation of said rod.

4,074,094

ELECTRIC SWITCH STRUCTURE INCORPORATING TRIP ROD FOR SENSING CABLE DERAILMENT AND THE LIKE

Bruno Lubbe, 3695 Warren Way, Reno, Nev. 89502

Filed Feb. 10, 1976, Ser. No. 656,806
Int. Cl.[2] H01H *3/16*; B61B *12/06*
U.S. Cl. 200—61.13 **8 Claims**



1. An electric switch structure including a housing, a disc set, means supporting the disc set within the housing, the disc set including electrical contacts, the disc set being moveable from a first position in which the electric contacts on two of the discs within the set are engaged to a second position in which said contacts are disengaged, a trip rod, means connecting the trip rod to the disc set to move the disc set from the first to the second position upon movement of the trip rod from a first to a second position, the connecting means including a shaft having a portion extending through an opening in the housing, a yolk connected to the trip rod, the yolk being positioned about and pivotally connected to the portion of the shaft external to the housing, the yolk of the trip rod including two faces which may be caused selectively to bear against the exterior surface of the housing, one face positioning the trip rod in a first, extended position, the other face positioning the trip rod in a second, deflected position.

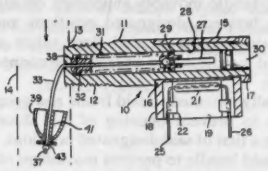
4,074,095

FLOW OPERABLE SWITCH DEVICE

Robert F. Romanowski, Rochester, N.Y., assignor to Qualitrol Corporation, Fairport, N.Y.

Filed Sept. 10, 1976, Ser. No. 722,010
Int. Cl.[2] H01H *35/40*
U.S. Cl. 200—81.9 M **5 Claims**

1. A fluid flow operable switch device comprising a housing, a reed switch mounted to the housing having a pair of contacts at least one of which is magnetically attractible, a magnet movable in an elongated bore of the housing into and out of a zone of effective magnetic flux influence upon the contacts of the switch, a spring biasing the magnet into the zone, a string connected to the magnet and projecting externally of the housing, and a pull element connected to the projecting end of the



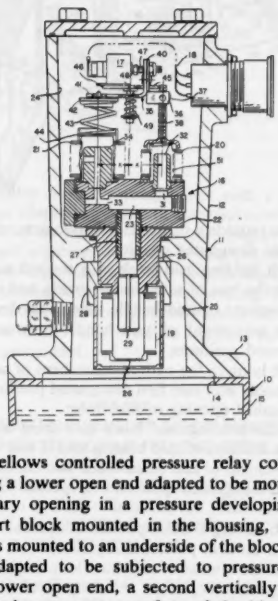
string responsive to a predetermined fluid flow applied to it in a direction away from the housing to draw the magnet out of said zone.

4,074,096

BELLOWS CONTROLLED SUDDEN PRESSURE RISE RELAY

Robert F. Romanowski, Rochester, N.Y., assignor to Qualitrol Corporation, Fairport, N.Y.

Filed Oct. 6, 1976, Ser. No. 730,200
Int. Cl.[2] H01H *35/32*
U.S. Cl. 200—83 D **5 Claims**



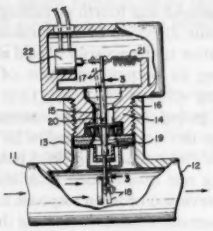
1. A fluid bellows controlled pressure relay comprising a housing having a lower open end adapted to be mounted over a complementary opening in a pressure developing tank, a bellows support block mounted in the housing, a pressure sensing bellows mounted to an underside of the block having a bottom end adapted to be subjected to pressures applied through said lower open end, a second vertically extending bellows mounted to an upper surface of the block, a third bellows mounted to the upper surface of the block in spaced parallel relation to the second bellows, the interiors of the several bellows being connected in communication with a common channel in the block, the channel and connected bellows defining a closed hydraulic circuit filled with fluid, a switch having a push-pin switch contact in an electrical alarm circuit, a bracket pivoted intermediately of its ends to a stationary support and supported in a balanced condition at its ends upon the second and third bellows, a switch actuating element carried by the bracket disposed in the balanced condition of the bracket in ineffective abutting relation to the push-pin switch contact, the second bellows having an orifice communicating its interior with the common channel, and the third bellows having a relatively larger port communicating its interior with the common channel, the sensing bellows being

contractible upon sensing pressure variations applied through said lower open end to force fluid from the channel to the orifice and larger port respectively of the second and third bellows, the second bellows having a larger diameter area subject to pressures from the channel fluid entering the orifice than the third bellows has subject to pressure from the channel at the larger port, the second and third bellows being responsive to normal pressure changes from the channel in such manner as to maintain the bracket in neutral position whereby the switch actuating element will not actuate the push-pin switch contact, and the second and third bellows being responsive to sudden pressure changes from the channel in such manner that the bracket is caused to swing about its pivot to cause the switch actuating element to actuate the push-pin switch contact.

4,074,097
FLUID RESPONSIVE SEALED PIVOT ARM MEANS

Harold D. Hutchinson, 26734 W. Latigo Shore Drive, and William C. Gregge, 6902 S. Fernhill Drive, both of Malibu, Calif. 90265

Filed Oct. 18, 1976, Ser. No. 733,475
Int. Cl.² H01H *35/40*
U.S. Cl. 200—81.9 R **4 Claims**



1. A fluid response sealed pivot arm means inserted in a fluid chamber portion and responsive to fluid movements in said chamber to physically rock and thereby transmit the movement to the exterior of the chamber, said sealed pivot arm means including, in combination:

a. body means communicating with said portion of the fluid chamber and including a bore of given diameter having an increased diameter portion at the end of said bore opening into said fluid chamber;

b. an elongated arm means passing through said bore so that an outer end is exterior of the chamber, an inner end is within the chamber, and a central portion is in said bore;

c. a pivot pin passing transversely across said bore and into said central portion of said arm means for pivoting the arm means for rocking movement, the central portion of the arm means having a diameter less than said given diameter to define within the inside wall of said bore an annulus;

d. a rolling diaphragm having its outer periphery terminating in an annular bead received in said increased diameter portion, the inner portion of said diaphragm being secured to said arm means, the annular portion of the diaphragm between its inner portion and outer periphery folding to define an annular rolling portion filling said annulus between the inner wall of said bore and the outer wall of said central portion of said arm means so that rocking movement of said arm means can be accommodated by said rolling portion of said diaphragm while said diaphragm provides a fluid tight seal between the fluid chamber and exterior;

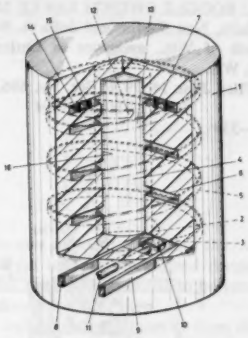
e. a washer assembly overlying said annular bead and secured to said body means to retain the annular bead in said increased diameter portion of said bore; and,

f. a flexible boot and filter combination secured to said washer assembly loosely surrounding said inner portion of said arm means for excluding particles in the fluid from passing into said annulus beneath the rolling portion of said diaphragm.

4,074,098
ELECTRIC ARC EXTINCTION APPARATUS

Albert Pullen, Bergentheim, Netherlands, assignor to Hazemeijer B.V., Hengelo, Netherlands

Filed Mar. 26, 1976, Ser. No. 670,672
Int. Cl.² H01H *33/16*
U.S. Cl. 200—144 R **13 Claims**



1. An electric arc extinguishing apparatus, comprising:

an arc initiation mechanism including two electrodes for initiation of an electric arc therebetween;

two conductors each respectively connected to one of said electrodes for conducting the electric arc at high velocity under the influence of a magnetic field generated by the supply current of the arc, whereby electric impedance is connected in series with said arc;

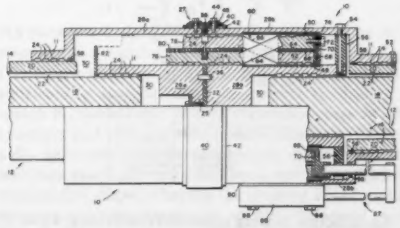
an annular contact gap between the ends of both said conductors; and

an arc resistant electrically insulating material including a winding channel, said two conductors being located in said winding channel such that the adjacent succeeding turns of said conductors are separated by the insulating walls of said channel, said annular contact gap maintaining the rotation of the arc caused by the wound conductors until said arc is extinguished, said winding channel emerging at one end thereof into an annular channel in said body containing said annular contact gap.

4,074,099
COAXIAL, POLARITY-REVERSING SWITCH

Donald B. Steen, Bowie, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 27, 1976, Ser. No. 754,282
Int. Cl.² H01H *3/24, 15/06*
U.S. Cl. 200—153 S **11 Claims**



1. A coaxial line switch comprising:

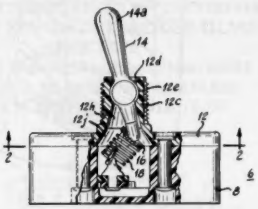
a cylindrical switch body member;
means for connecting the switch to the outer conductor of the coaxial line;
means for connecting the switch to the inner conductor of the coaxial line;
means coaxially mounted within said body member for selectively connecting, disconnecting and interconnecting the conductors of the coaxial line to control the flow of current through each of the conductors.

4,074,100

ELASTIC TOGGLE SWITCH LEVER MOUNTING

Harold W. Hults, New Berlin, and John A. Swessel, Jr., Milwaukee, both of Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed June 14, 1976, Ser. No. 696,112
Int. Cl.[2] H01H 3/04
U.S. Cl. 200—339 **1 Claim**



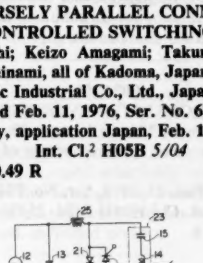
1. In an electric switch of the toggle lever type wherein a toggle lever having an enlarged intermediate pivot portion can be press fitted past a constriction in the aperture of a bushing formed of elastic material by deformation of the latter and is then seated and retained in a pivot socket in said bushing upon elastic restoration of said constriction to its former shape, the improvement comprising, providing the bushing pivot socket with spaced semi-spherical wall portions and parallel flat wall portions which merge at their opposite ends with said semi-spherical wall portions, and providing said toggle lever with a pivot portion which has surfaces that are complemental in form to and in juxtaposition with said semi-spherical and flat wall portions of said bushing pivot socket when seated therein.

4,074,101

INDUCTION HEATING APPARATUS USING A PAIR OF INVERSELY PARALLEL CONNECTED GATE-CONTROLLED SWITCHING DEVICES

Mitsuyuki Kiuchi; Keizo Amagami; Takumi Mizukawa, and Hideyuki Kominami, all of Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Feb. 11, 1976, Ser. No. 657,307
Claims priority, application Japan, Feb. 14, 1975, 50-19251
Int. Cl.[2] H05B 5/04
U.S. Cl. 219—10.49 R **23 Claims**



1. An induction heating apparatus comprising, a pair of input terminals connectable in use to a source of low frequency alternating voltage, at least a pair of first and second gate-controlled unidirectional conducting devices inversely parallel connected to the input terminals, means sensitive to the polarity of said alternating voltage for generating an output indicative of the polarity of the alternating voltage, means for gating on said first and second gate-controlled unidirectional conducting devices in succession at a high frequency in a given order in response to the output from said polarity sensitive means indicating one polarity of the alternating voltage and in succession at the high frequency in a reversed order in response to the output from said polarity sensitive means indicating the opposite polarity of the alternating voltage, and high-frequency commutating circuit means including an induction heating coil and a capacitor in series thereto responsive to a current produced when one of the gate-controlled conducting devices is gated on for producing in succession a commutating current that flows through said commutating circuit means and the subsequently gated-on gate-controlled conducting device in the opposite direction.

20. An induction heating apparatus comprising:
a first pair of inversely parallel connected first and second gate-controlled switching devices, a second pair of inversely parallel-connected third and fourth gate-controlled switching devices, the first and second pairs being connected in use in series to a source of low frequency alternating voltage, and wherein the first and third switching devices are poled in the same direction of conduction and the second and fourth switching devices are poled in the opposite direction of conduction;
means sensitive to the polarity of said alternating voltage for generating an output indicative of the polarity of the alternating voltage;
means for gating on said first, second, third and fourth switching devices in succession in a given order in response to the output from said polarity sensitive means indicating one of the polarity of the alternating voltage and in a reversed order in response to the output from said polarity sensitive means indicating the opposite polarity of the alternating voltage; and
high frequency commutating circuit means including an induction heating coil and a commutating capacitor in series thereto responsive to a current produced when one of the gate-controlled switching devices is gated on for producing in succession a commutating current that flows through said commutating circuit means and a subsequently gated-on switching device.

4,074,102

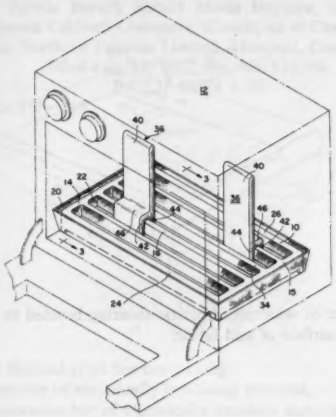
MICROWAVE OVEN RACK

Donald Asen, 114 Cornell Ave., Bala Cynwyd, Pa. 19004

Filed Mar. 10, 1976, Ser. No. 665,721
Int. Cl.[2] H05B 9/06
U.S. Cl. 219—10.55 E **29 Claims**

1. In an oven rack for use in holding food in a microwave oven, the combination of
a non-metallic base,
said base comprising means to support a plurality of food holding means; and

a plurality of non-metallic food holding means adjustably carried by the base to hold the food,



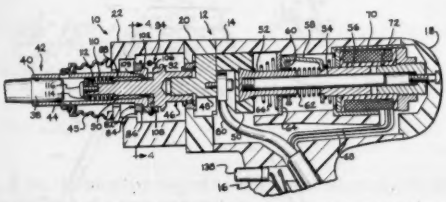
at least some of said food holding means comprising a food contacting arm which projects above the base to support food to be cooked in a desired position.

4,074,103

APPARATUS FOR WELDING STUDS TO WORKPIECES

Thomas E. Shoup, Amherst, and Steve Spisak, Elyria, both of Ohio, assignors to TRW Inc., Cleveland, Ohio

Filed Jan. 12, 1976, Ser. No. 648,052
Int. Cl.² B23K *11/04*
U.S. Cl. 219—98 **5 Claims**



1. Apparatus for welding a stud to a workpiece having an electrically-resistant coating thereon, said apparatus comprising a welding tool having chuck means extending outwardly therefrom for holding a weldable stud, means for moving said chuck means toward and away from the workpiece, means connected to said chuck means for rotating said chuck means, electrically-conducting means positioned adjacent portions of said chuck means and said moving means and in contact with both, said electrically-conducting means being generally radially segmented, means engagable with the segments for urging them radially inwardly, and resilient means for urging said chuck means and said moving means toward one another.

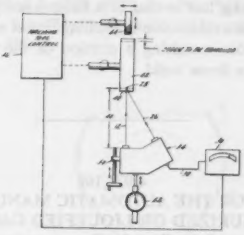
4,074,104

OPTO-ELECTRONIC POSITION SENSING METHOD

Emmet M. Fulkerson, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 534,552, Dec. 19, 1974, abandoned. This application Apr. 29, 1976, Ser. No. 681,737
Int. Cl.² B23K *9/00*
U.S. Cl. 219—121 LM **3 Claims**

1. A method for removing a predetermined depth of material from a workpiece target capable of at least partially reflecting light in a scattered manner, through the application of a material removal tool, wherein a narrow incident beam is directed along an incident beam axis onto the target, scattered light from the incident beam reflected from the target is collected from a position other than on the incident beam axis along a reflected light axis which intersects the incident beam axis at an axis intersection, the scattered light being focused on a photosensitive means which provides an output signal including a portion which is a function of displacement of the focused light from a reference of the photosensitive means representing the axis intersection, the improvement comprising the steps of:



positioning the axis intersection within the workpiece beneath the target at a predetermined distance which is related to the amount of material to be removed by the material removal tool; and then

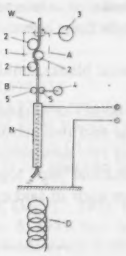
operating the tool to remove material from the workpiece until the focused light approaches a preselected position in respect to the reference of the photosensitive means as a function of the approach of the incident beam to the axis intersection.

4,074,105

ARC WELDING METHOD AND ARC WELDING APPARATUS

Setsuzi Minehisa, Itami; Tatuo Inui, Osaka, and Hitoshi Fukuda, Shiki, all of Japan, assignors to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka, Japan

Filed Nov. 21, 1975, Ser. No. 634,190
Claims priority, application Japan, Nov. 22, 1974, 49-135770; Apr. 11, 1975, 50-44425
Int. Cl.² B23K *9/12*
U.S. Cl. 219—137.8 **5 Claims**



1. An electric arc welding method, in which molten metal is deposited along a welding line, comprising the steps of:

(a) feeding a welding wire, which has been arranged in a substantially straight line, into a plastic deforming zone which is continuously rotated through a range of 360°;

(b) causing said wire supplied to said zone to be first plastically deformed from its substantially straight line shape, and then plastically reformed back into said substantially straight line shape, whereby the welding wire supplied to said zone is simultaneously spirally deformed and reformed and also subjected to a unidirectional continuous rotary circular motion through a 360° range;

(c) feeding the welding wire after it leaves the plastic de-

forming zone to an elongated nonconsumable welding nozzle positioned at the welding line;

(d) causing the welding wire to leave the tip of the welding nozzle so that it is at an angle with respect to the central axis of said nozzle and also is rotating through a range of 360°;

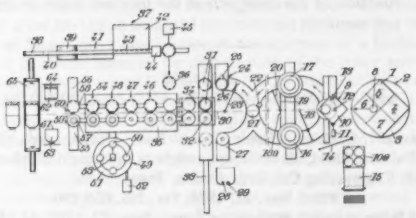
(e) simultaneously causing the welding nozzle to move from one end of the welding line to the other end thereof, whereby the path traversed by the bent and rotating end of the welding wire as it leaves the welding nozzle along the welding line is that of a helix wholly contained in a single plane thus achievng full agitation of the weld metal by periodic remelting a portion of the welding line to produce a dense weld.

4,074,106

METHOD FOR THE AUTOMATIC MANUFACTURE OF PRESSURIZED OR LIQUEFIED GAS TANKS

Paul Nee, Dange-Saint-Romain, France, assignor to Roger Pelleray, France

Division of Ser. No. 457,216, April 1, 1974, Pat. No. 3,943,615.
This application Dec. 31, 1975, Ser. No. 645,662
Claims priority, application France, Apr. 9, 1973, 73.12705
Int. Cl.[2] B23K 9/12
U.S. Cl. 219—137 R **3 Claims**



1. In a method for manufacturing pressurized or liquefied gas tanks or containers which comprise two substantially cylindrical parts closed at one end and open at the other end, the free edges of the cylindrical parts substantially defining the cross-section of the tanks or containers and said two parts being welded to each other, the improvement comprising the following steps:

cutting two metal blanks simultaneously from a single metal sheet;

stamping said blanks simultaneously at two separate stations so as to form said two substantially cylindrical parts; and

assembling said two substantially cylindrical parts by welding the cylindrical parts together along the free edges of the said open ends of said cylindrical parts.

4,074,107

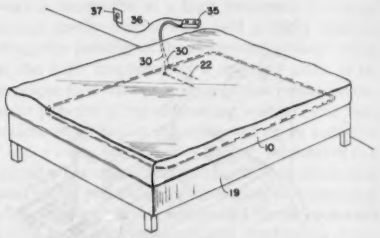
COMFORT QUILT

Margurita L. Moss, N. Miami Beach, Fla., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Oct. 19, 1976, Ser. No. 733,808
Int. Cl.[2] H05B 1/00
U.S. Cl. 219—212 **1 Claim**

1. A quilt, shaped to fit about the top surface, sides and bottom edges of a mattress to which the quilt may be attached, such that the quilt may be directly attached to a said mattress, so as to serve as an electrically heatably waterproof mattress cover; upon which a user may rest,

said quilt formed of a top surface of insulated fabric in which an electrical heating element is embedded, together with a



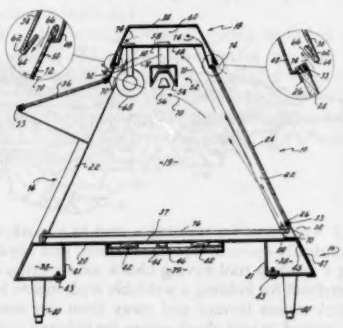
cover of waterproof plastic sheeting bonded to the exterior surface of said fabric.

4,074,108

COUNTERTOP DISPLAY WARMER

James D. King, Dayton, Ohio, assignor to Henny Penny Corporation, Eaton, Ohio

Filed Sept. 13, 1976, Ser. No. 722,474
Int. Cl.[2] H05B 1/00
U.S. Cl. 219—214 **10 Claims**



1. A countertop display warmer comprising:

transparent front and sides and an open rear,

a base member having a concave outer bottom surface providing a first air space below said warmer,

a ceiling member defining with said base member, said front, and said sides, a warmer chamber,

a canopy mounted over said ceiling member defining a second air space therebetween,

first heating means disposed in said first air space for heating said base member,

second heating means in spaced relation to said ceiling for heating said warmer chamber,

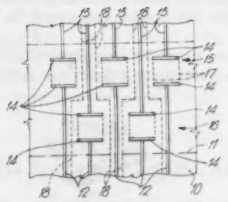
an opening along the lower edge of said front and the upper edge of said rear providing a generally upwardly and rearwardly directed ventilation path through said warmer chamber, and

an opening along the lower edge of said canopy providing a second ventilation path through said second air space.

4,074,109
THERMAL PRINT BAR

David Robbin Baraff; Robert James Boynton, Ottawa, and Frederick Caldwell Livermore, Kanata, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed July 15, 1977, Ser. No. 815,794
Int. Cl.[2] H05B 1/00
U.S. Cl. 219—216 10 Claims

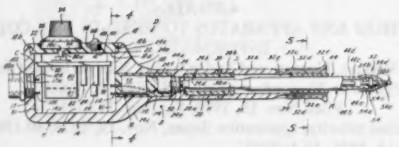


1. A thermal print bar comprising:
a substrate of electrically insulating material;
a continuous bar of electrically resistive material on a surface of said substrate;
electrical conductor patterns extending beneath said bar to define two rows of print elements extending along the bar, the print elements of one row offset relative to the print elements of the other row, in the direction of the longitudinal axis of the bar.

4,074,110
HAND HELD ELECTRIC HEATING DEVICE

Philip E. Slaughter, 4552 Elm St., Bellaire, Tex. 77401

Filed Dec. 2, 1975, Ser. No. 637,080
Int. Cl.[2] H05B 1/02; B23K 3/04; H05B 3/06
U.S. Cl. 219—240 14 Claims

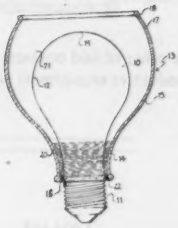


1. An electrically powered heating device adapted to be held in the hand of a user, comprising:
elongated electrical heating means for providing localized heating over various selected heating ranges for a variety of applications, said elongated electrical heating means comprising;
an elongated substantially rigid tubular sheath;
an electric heating element in said sheath;
terminal means at one end of said sheath; and,
collet means at the other end of said sheath for removably receiving and holding a heating tip in a heat exchange relation to said electric heating element;
an elongated sleeve means of thermally insulative material disposed in spaced relation about and covering a major portion of said heating means for gripping by the user and for thermally insulating the user's hand from said heating means, said collet means being spaced from one end of said sleeve means;
a body member formed having an enlarged housing portion and a reduced neck portion, said neck portion releasably engaging said terminal means of said heating means, said neck portion having a first end and a second end, said first end formed with said enlarged housing portion providing a thermal barrier between said heating means and said enlarged housing portion, said second end adapted to releasably engage the other end of said sleeve means;
an electronic control circuit coupled to said heating means for selectively controlling a heating temperature of said heating means over various selected heating ranges; and
said enlarged housing portion formed with a cavity therein for housing said electronic control circuit.

4,074,111
VAPORIZING ATTACHMENT FOR LIGHT BULBS

William George Hunter, 704 Kingsmere Cresc. SW., Calgary, Canada

Filed Jan. 27, 1977, Ser. No. 762,864
Int. Cl.[2] F22B 1/28; A61L 3/00
U.S. Cl. 219—275 2 Claims



1. An article of manufacture comprising in combination a vaporizing shroud and an electric light bulb, said electric light bulb including an envelope and a metal screw threaded base secured to one end of the envelope, said shroud including an open lower, relatively small, reservoir end portion and an open upper, relatively large, evaporating portion, means to detachably secure said shroud by the lower end thereof around the portion of said envelope adjacent said metal base whereby said shroud is sealably secured to said envelope and extends upwardly therefrom in spaced relationship, said lower end portion forming an annular reservoir around said light bulb, said upper end portion forming an evaporating chamber above said reservoir and means to sealably secure said shroud to said light bulb, said last mentioned means including epoxy resin adhesive between said lower small end of said shroud and the associated portion of said envelope above said metal base and a flexible elastomeric O ring surrounding said associated portion of said envelope and within said epoxy resin and being in wedging contact with the inner surface of said lower small end of said shroud thereby sealing said lower small end to said envelope.

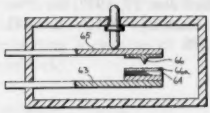
4,074,112
SWITCH ASSEMBLY HAVING MOVABLE CONTACT FACE CONFIGURATION FOR PENETRATING FROST OR ICE LAYER ON ADJACENT CONTACT SURFACE

Arthur J. Runft, Mequon, Wis., assignor to Kelley Co., Inc., Milwaukee, Wis.

Division of Ser. No. 428,923, Dec. 27, 1973, Pat. No. 3,922,814.
This application Nov. 5, 1975, Ser. No. 629,057
Int. Cl.[2] H01H 1/12, 9/00
U.S. Cl. 200—279 4 Claims

1. An automatic door operator having a control circuit connected to an electrically controlled motor means for controlling door movement in a freezing environment wherein frost forms on the surfaces within the environment, comprising a control switch adapted to be connected in said control circuit and having a pair of opposed electrical contacts, said contacts having opposed contact faces and said contacts solely moving on a line essentially perpendicular to said contact faces for opening and closing an electrical conductive path therebetween in response to the movement directly toward and away from each other on the line through said contacts, a first of said contacts having the contact face formed with a pimple and the other of said contacts having the contact face with a plurality

of serrations defining a series of sharp contact peaks, said pimple defining a penetrating means to disrupt frost on said



serrations of the other of said contacts and permit said pimple to move into conductive engagement with said second contact.

4,074,113

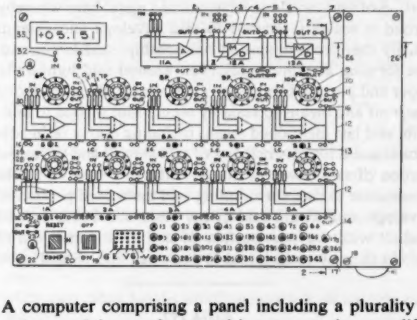
PUNCHED-CARD PROGRAMMABLE ANALOG COMPUTER

Edwin Zenith Gabriel, 318-B South St., Eatontown, N.J. 07724

Filed Jan. 19, 1976, Ser. No. 650,255

Int. Cl.[2] G06G *7/06, 7/48;* **G09B** *23/02*

U.S. Cl. 235—419 **6 Claims**



1. A computer comprising a panel including a plurality of computing modules, each comprising a summing amplifier circuit and integrator circuit, and means for connecting the output of one computing module to the input of another computing module and a punched-card means for interconnecting said modules in a preselected manner to solve a predetermined mathematical differential equation and wherein said panel further includes a plurality of coefficient potentiometers, on/-off switches and jacks, means for interconnecting selected components for forming an analog model of a physical system;

voltage responsive indicator means;

mode control switching means for

a. "reset" position and means for setting said integrator circuit to their initial values,

b. "compute" position and means for setting said integrator circuits to allow an applied voltage to appear at said integrator circuit output,

c. "hole" position and means for removing the input voltage to said integrator circuits;

whereby a user of said computer can connect desired computing circuits to model and simulate dynamic physical systems whose output response can be observed on said voltage responsive indicating means.

4,074,114

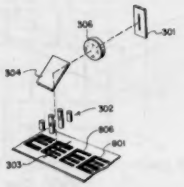
BAR CODE AND METHOD AND APPARATUS FOR INTERPRETING THE SAME

Bruce W. Dobras, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Mar. 12, 1976, Ser. No. 666,569

Int. Cl.[2] G06K *7/10;* **G08C** *9/06;* **G06K** *9/00, 10/06*

U.S. Cl. 235—463 **29 Claims**



1. An apparatus for reading and interpreting a bar-encoded record bearing a group of substantially parallel, scannable bars having distinctive light reflective characteristics and whose widths represent encoded data, said apparatus comprising:

light responsive means including a linear series of photodetectors arranged along a single straight line for generating a signal whose amplitude fluctuations reflect the spatial variations of the incident light intensity along said series of photodetectors;

means for simultaneously projecting an image of the record onto said series of photodetectors, said record image being along a line generally perpendicular to said group of bars; and

decoding means attached to said light responsive means for decoding the amplitude fluctuations of said signal into data.

4,074,115

METHOD AND APPARATUS TO READ-IN BAR-CODED INFORMATION

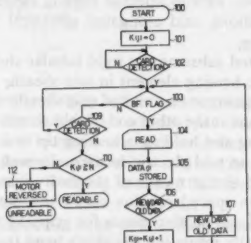
Akio Sugiura, Nagoya, and Tadao Nojiri, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 15, 1976, Ser. No. 742,121

Claims priority, application Japan, Nov. 19, 1975, 50-139424; Sept. 14, 1976, 51-110209

Int. Cl.[2] G06K *7/10;* **G08C** *9/06*

U.S. Cl. 235—462 **11 Claims**



1. A method to read-in bar-coded information provided on a surface of an object in bar codes having a plurality of bar symbols of at least two kinds of bar width comprising the steps of:

placing said object to read-in said bar-coded information,

sensing said bar-coded information along a line on the surface of said object,

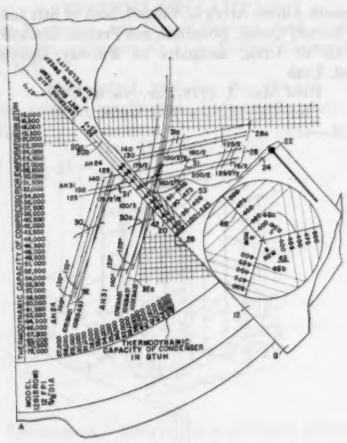
converting said bar-coded information to a group of electrical signals,

storing said group of electrical signals,
comparing said group of electrical signals with a previously stored group of electrical signals to discriminate a coincidence between said two groups of electrical signals,
counting to accumulate said coincidence,
sensing said bar-coded information along a line which is different from the previous line on the surface of said object,
repeating the same steps of converting, storing, comparing, counting and sensing as above until said object has been carried out of all lines along which said sensing is made, and,
providing a discrimination signal when the number of coincidence times does not reach a predetermined value.

4,074,116
SELECTOR

William M. Ell, 5513 Trent Court, Apt. 261, Alexandria, Va. 22311

Filed Oct. 14, 1976, Ser. No. 732,277
Int. Cl.[2] G06C *27/00, 1/02*
U.S. Cl. 235—83 **7 Claims**

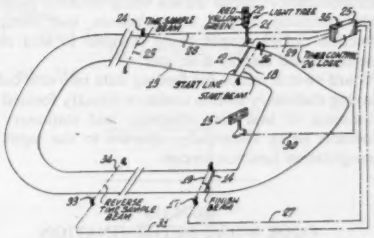


1. In a selector for choosing components for thermodynamic systems such as air conditioning systems, in which said components include a compressor, a condenser, an expansion valve and an evaporator said selector comprising a planar base, an arcuate chart on said base, a pivot on said base, said pivot establishing a point of origin for said chart, a half line on said base extending from said point of origin, indicia on said half line expressing thermodynamic capacities expressed in B.T.U.H. from a minimum near said point of origin to a maximum at a position remote from said point of origin required by said system, said halfline dividing said chart into at least a first and a second quadrant, at least one set of curves (**28**) on said first quadrant representing thermodynamic information necessary for selection of a compressor, at least one second set of curves (**30**) on said first quadrant representing information necessary for selection of a condenser suitable for use with the selected compressor, a first pivoted arm extending from said point of origin as a pivot across said first quadrant said arm including a datum point (**26**) and a first scale expressed in units of temperature extending from said datum point decreasing toward said point of origin, said scale reading 39° F at said datum point, a second scale on said first pivoted arm referring to a correction factor of 1.0 at said datum point and diminishing to 0.0 at said point of origin, a movable pointer (**24**) on said first pivoted arm to be positioned along said first pivoted arm to indicate on said scales on said arm temperatures and correction factors determined in connection with the selection of said compressor by use of said scales and pointer; the improvement including at least one scale on said first pivoted arm extending radially outwardly from said datum point expressed in units of air velocity reading 525fpm at the datum point (**26**), to a velocity of 400cfm radially outwardly thereof, and a second pivoted arm extending from a pivot at said point of origin to overlie said second quadrant, said second pivoted arm being provided with a plurality of scales extending there along; a scale reading in square feet of area of an evaporator; C.F.M. of air that is necessary for an evaporator of that area at 525fpm and a correction factor of 1.0; and at least one scale denoting dimensions of standard evaporators, and a plurality of radial lines lying near the edge of said chart each said radial line indicating an evaporator by catalogue number and other pertinent data, whereby, after a compressor has been selected, a complementary evaporator may be selected by catalogue number.

4,074,117
TIMING SYSTEM

Jack Z. DeLorean, Bloomfield Hills, and David C. Bacon, East Detroit, both of Mich., assignors to Grand Prix of America, Inc., Birmingham, Mich.

Continuation of Ser. No. 458,175, April 5, 1974, abandoned. This application Apr. 26, 1976, Ser. No. 680,415
Int. Cl.[2] G04F *10/00*
U.S. Cl. 235—92 T **23 Claims**



1. Apparatus for sequentially starting and timing a plurality of participants traversing a designated course, said apparatus comprising:
sensing means for detecting the presence of participants at selected positions in the course;
timing means responsive to signals from said sensing means for determining for each participant a sample time measured over a selected portion of the course and a total time over the complete course;
control means for automatically starting the participants over the course at spaced time intervals derived from the respective sample times of immediately preceding participants, said control means including means for generating a control signal after a delay time derived from the sample time determined by said timing means, and means responsive to the control means for signaling a participant to start; and
display means connected to said timing means, for automatically displaying the total time for each participant completing the course.

4,074,118
CALCULATOR CONSTRUCTION

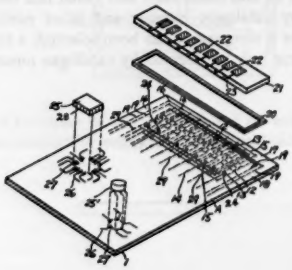
Isamu Washizuka, Kyoto; Shintaro Hashimoto, Shiki, and Saburo Katsui, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 403,857, Oct. 5, 1973, abandoned. This application May 12, 1975, Ser. No. 576,834

Claims priority, application Japan, Oct. 6, 1972, 47-100996; Apr. 24, 1973, 48-46929

Int. Cl.[2] **G06F** *7/38*

U.S. Cl. 364—712 **14 Claims**



1. An electronic calculator comprising:

a pair of substantially planar dielectric substrates constructed and arranged to define a cavity therebetween, one of said substrates being larger than the other in the provision of an extension of said one substrate beyond said cavity;

a liquid crystal display unit, a liquid crystal composition being contained in said cavity, said liquid crystal display unit including electrode means formed on said dielectric substrates;

semiconductor circuit means including at least a computation function circuit having an input and an output, said semiconductor circuit means being directly mounted on said extension of said one substrate, said computation function circuit output being coupled to said electrode means of said display unit; and

keyboard switch means for feeding data into said calculator having stationary switch contacts directly formed on said extension of said one substrate, said stationary switch contacts being electrically coupled to the input of said computation function circuit.

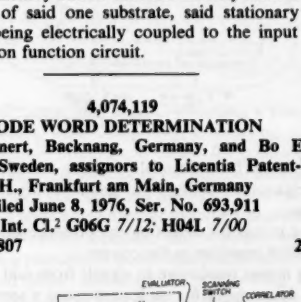
4,074,119
CODE WORD DETERMINATION

Wolfgang Steinert, Backnang, Germany, and Bo Ekström, Stockholm, Sweden, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed June 8, 1976, Ser. No. 693,911

Int. Cl.[2] **G06G** *7/12;* **H04L** *7/00*

U.S. Cl. 364—807 **2 Claims**



2. In a receiver of a transmission system operating with multiple phase modulation or multiple phase difference modulation transmission and coherent demodulation reception and in which a unique word is transmitted only as signals in two phases which are 180° apart and the received signals are divided during demodulation into two orthogonal voltage components representing the amplitude and relative phase angle of a received signal, the improvement comprising a circuit for producing a single value whose algebraic sign is determinative of the two-phase signal and including: divider means connected to receive the two orthogonal components of the received signals for producing a quotient signal representing the ratio of the amplitudes of such components; multiplier means connected to receive the quotient signal from said divider means and one of the orthogonal components for producing a product signal representing the product of its received signals; and summing means connected to receive the product signal from said multiplier means and the other one of the orthogonal components for producing a sum signal representing the sum of its received signals and constituting the single value.

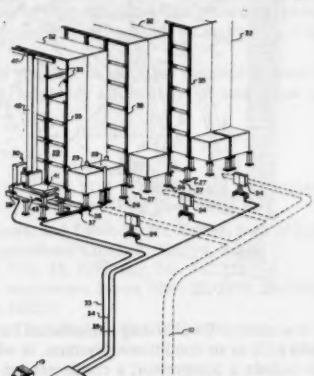
4,074,120
AUTOMATED MATERIALS STORAGE SYSTEM AND METHOD

James Kenneth Allred; Arlyn G. Liddell, both of Salt Lake City; Edward Barney Quinn, Bountiful, and Francis Bischoff Black, Sandy, all of Utah, assignors to Kenway Incorporated, Bountiful, Utah

Filed Mar. 2, 1976, Ser. No. 663,177

Int. Cl.[2] **B65G** *47/00;* **G06K** *7/10*

U.S. Cl. 235—419 **20 Claims**



1. A method of automatically addressing and handling goods in a high-rise storage system utilizing an electronically controlled storage and retrieval (S/R) machine, a central processing unit (CPU), a storage operator station and a storage aisle console, comprising the steps of:

establishing in the CPU memory a part number file of all goods acceptable for storage;

establishing in the CPU memory a storage inventory file of all goods actually stored in the high-rise storage system;

establishing in the CPU memory a transaction file of all goods in transit to or from the high-rise storage system;

providing a plurality of transaction code numbers which can only be associated with a load of goods at the storage operator station;

examining the load of goods to be stored and entering a description of the goods into the CPU at the storage operator station;

verifying the descriptive information entered into the CPU by electronically comparing the descriptive information

with the part number file of acceptable goods to determine if the description of the goods is found in the part number file;

electronically associating a transaction code number with the description of the load only if the description is found in the part number file and thereafter electronically storing the description in the transaction file at an address identifiable by the transaction code number;

physically associating the transaction code number with the load in a machine-readable form so as to eliminate further human interpretation of the goods to the CPU;

printing an identification label bearing the descriptive information and associating the printed label with the load of goods;

removing the labeled goods to a pick up station of the high-rise storage system;

reading the transaction code number into the aisle console so as to identify the description of the goods to the CPU without human interpretation thereof; and

transferring the goods to the S/R machine from the pickup station and storing the goods in a CPU-selected location.

4,074,121
PHOTOFLASH LAMP UNIT

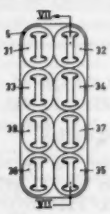
Henricus P. Jagers, and Rudolf Sanders, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 1, 1976, Ser. No. 701,636

Claims priority, application Netherlands, July 2, 1975, 7507855

Int. Cl.[2] G03B *15/02*

U.S. Cl. 362—13 **5 Claims**



1. A flashlamp unit comprising: a generally planar supporting member; a plurality of photoflash lamps secured to said supporting member, each lamp being elongated and having a longitudinal axis, each said longitudinal axis being disposed parallel to said generally planar supporting member; and a reflector disposed between said supporting member and said plurality of lamps, said reflector surface proximate to each lamp being (a) generally concave on a side facing said plurality of lamps (b) having an elongated aperture therein, and (c) having at least one elastically deformable lug abutting said elongated aperture, said lug being bendable elastically away from the contiguous surface, said lug in the bent position enlarging said elongated aperture.

4,074,122
FLUORESCENT LANTERN

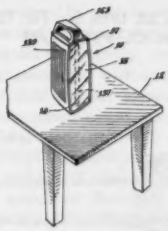
Arthur H. Moore, Fairfield, Conn., assignor to The Bridgeport Metal Goods Manufacturing Company, Bridgeport, Conn.

Filed Feb. 2, 1976, Ser. No. 654,156

Int. Cl.[2] F21L *7/00*

U.S. Cl. 362—200 **7 Claims**

1. A fluorescent lantern comprising a single piece chassis, said chassis having a unitary reflector section and a compartment section integral with said reflector section, battery means disposed in said compartment section, a fluorescent lamp supported by said reflector section so as to direct its light outwardly from said chassis, and means for electrically connecting said fluorescent lamp to said battery means, wherein said unitary reflector section is comprised of a concave rectangular reflector, said concave reflector defining a lens opening, a sealing rim integral with said concave reflector being peripherally disposed around said lens opening, said concave reflector also having a pair of integral sockets located at opposite ends of said concave reflector, said sockets being aligned on the apex of said concave reflector facing said lens opening, and wherein said compartment section is rectangular and longitudinally aligned with said reflector section, said compartment section being integral with said concave reflector opposite said sockets and said lens opening, and wherein said compartment



section is comprised of a pair of sidewalls connected together at each end by a pair of integral end portions, each of said sidewalls also having an integral perpendicular divider wall extending almost to the opposite sidewall, each of said divider walls being disposed equidistant to but on opposite sides of the midpoint of said compartment section, said divider walls thereby defining with a portion of said sidewalls a switching mechanism compartment between themselves, and each divider wall also defining a battery compartment with a portion of said sidewalls and said end portion closest to said divider wall.

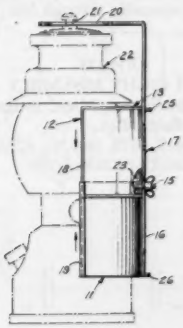
4,074,123
COMBINATION REFLECTOR AND LIGHT SHIELD

Lawrence H. Wissinger, 337 Montgomery Ave., Springfield, Ohio 45506

Filed June 23, 1976, Ser. No. 698,866

Int. Cl.[2] F21V *7/00*

U.S. Cl. 362—319 **1 Claim**



1. A combination reflector and light shield for a lantern, comprising a threaded bolt fastener which receives a wing nut, said bolt fastener being removably received through the said reflector, the said light shield, and said light shield is translucent, so as to be alternately used with said reflector which is opaque, the said combination of said light shield and said reflector being semi-cylindrical in configuration and slidably engaging each other, and said reflector has an elongated slot which receives said bolt fastener, and said light shield has, secured fixedly thereto, a metal plate on its concave portion, which receives said bolt fastener and a lip with an opening, is

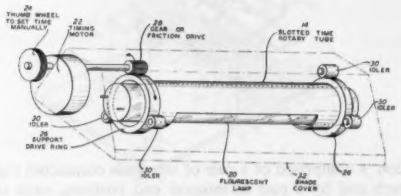
fixedly secured on a peripheral edge of both said light shield and said reflector for receiving a bracket for a lantern.

4,074,124

ILLUMINATION APPARATUS FOR SIMULATING NIGHT, DAWN AND MORNING, MID-DAY AND AFTERNOON AND DUSK NATURAL LIGHT CONDITIONS

Charles J. Maute, 66 Ball Road, Mountain Lakes, N.J. 07046, and Anthony V. Ianetti, 4 Trojan Ave., Parsippany, N.J. 07054

Filed Sept. 22, 1976, Ser. No. 725,441
Int. Cl.² F21V *11/18*
U.S. Cl. 362—217 **3 Claims**



1. Illumination apparatus for simultating night, dawn and morning, mid-day and afternoon and dusk natural light conditions, comprising:

means for providing a source of artificial light; and

shutter means including a pair of shutters operatively associated with said source of artificial light for totally concealing said source of artificial light during a first predetermined amount of time to simulate said night condition, for gradually exposing increasingly larger portions of said source of artifical light during a second predetermined amount of time to simulate said dawn and morning conditions, for constantly exposing a predetermined portion of said source of artificial light during a third predetermined amount of time to simulate said mid-day condition, and for gradually concealing increasingly larger portions of said source of artificial light during a fourth predetermined amount of time to simulate said afternoon and dusk conditions, and

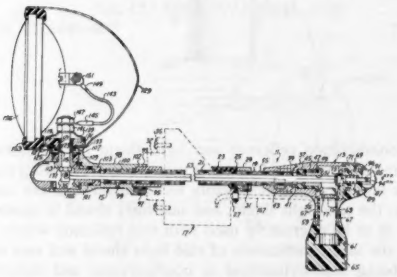
one of said shutters mounted fixedly and the other of said shutters mounted rotatably through 360°.

4,074,125

SPOT LIGHT ASSEMBLY

Robert A. Casalou, Birmingham, Mich., assignor to Robert A. Casalou, Inc., Southfield, Mich.

Filed Nov. 5, 1975, Ser. No. 629,005
Int. Cl.² F21M *3/18*
U.S. Cl. 362—271 **2 Claims**



1. In a spot light assembly including a support tube journalled and retained upon a frame, having a handle assembly secured over one end of said tube, a head assembly secured over the other end of said tube and mounting a spot light, rotation of the handle assembly in a vertical plane effecting a corresponding angular adjustment of the spot light in a vertical plane, a rotatable drive shaft within said tube with its ends extending respectively into said handle assembly and head assembly, an upright stud mounted in said head assembly, said handle asembly including a handle rotatable in a horizontal plane, and intermeshing gear means on said handle, on end portions of said drive shaft and on said stud, and connected to said spot light, whereby rotation of said handle in a horizontal plane effects corresponding rotation of the spot light in a horizontal plane; the improvement comprising:

said drive shaft at one end being in brush contact with said stud;

a lead wire interconnecting said stud and spot light; and

a normally opened switch in said handle assembly connected to an electric power source, and including a spring-biased retracted contact spaced from the other end of said drive shaft;

said handle assembly including an open-ended housing receiving one end of said support tube; said intermeshing gear means including a pair of bevel gears journalled on said housing in insulated relation; and a plastic handle journalled upon and depending from said housing and connected to one of said bevel gears;

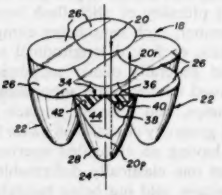
the connection of said handle to one of said bevel gears including an axial shaft on said gear at one end secured within said handle for rotation in unison, there being an annular groove in said shaft; a plastic switch-holding cap mounted over one end of said housing and secured thereto; and a bifurcated tongue on said cap extending into said shaft groove and anchoring said handle upon said housing.

4,074,126

LIGHTING PANEL

Thomas W. Dey, Rochester, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation-in-part of Ser. No. 480,343, June 18, 1974, abandoned. This application Nov. 17, 1975, Ser. No. 632,611
Int. Cl.² F21V *5/00*
U.S. Cl. 362—297 **10 Claims**



1. A luminaire assembly for providing controlled light distribution, comprising:

a light source for emitting light;

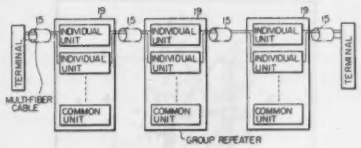
reflector means receiving substantially all the light emitted from the light source for directing substantially all such received light as locally unidirectional light to a reflector aperture; and

a lighting control panel disposed across the reflector aperture and having a plurality of light modifying elements, each element being disposed in said lighting control panel to receive the locally unidirectional light from said reflector means and having first interface surface means for providing total internal reflection of substantially all the received locally unidirectional light and second interface surface means for refracting substantially all the totally internally reflected light upon leaving the elements into a control range.

4,074,127
OPTICAL PCM GROUP TRANSMISSION REPEATING SYSTEM

Yukou Mochida; Tadao Ogawa, both of Kawasaki, and Kazuo Yamaguchi, Hiratsuka, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 24, 1976, Ser. No. 717,273
Claims priority, application Japan, Aug. 26, 1975, 50-102524
Int. Cl.[2] H04B 9/00
U.S. Cl. 250—199 12 Claims



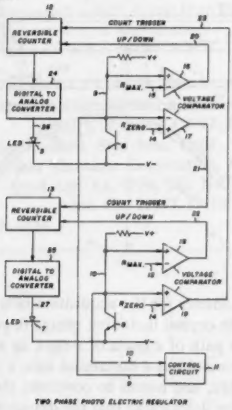
1. A light PCM group transmission repeating system for transmitting PCM information by means of a plurality of optical fiber groups each of which is composed of a plurality of optical fibers comprising: group repeaters provided for each optical fiber group, each group repeater having a plurality of individual means for regenerating the PCM information as transmitted through a plurality of said optical fibers, each group repeater having additional means commonly connected to said individual means for simultaneous control thereof;

each of said individual means for each group repeater including an individual opto-electric converter circuit, an amplifier, an equalizer and an electro-optic converter circuit for each of a plurality of said optical fibers, and said commonly connected additional means for simultaneous control of said individual means including at least one of the following circuits, an automatic gain control circuit, a light element control circuit, a power supply circuit, a timing circuit, and a supervisory circuit.

4,074,128
PHOTOELECTRIC SIGNAL GENERATING CIRCUITS

Samuel C. Harris, Jr., Waynesboro, and William A. Hanger, Churchville, both of Va., assignors to General Electric Company, Waynesboro, Va.

Continuation of Ser. No. 683,418, May 5, 1976, abandoned. This application Apr. 22, 1977, Ser. No. 789,854
Int. Cl.[2] G01J 1/32
U.S. Cl. 250—205 10 Claims

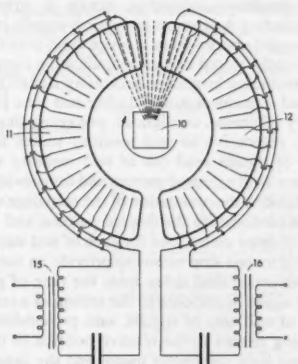


1. An arrangement wherein a shaft encoder comprises a first and second source of light, and means are provided for pulsing said sources of light with light opaque and light transparent segments provided on a rotating disc and representative of the angular position of the shaft, means for regulating the light intensity of said sources comprising a first and second sensor for sensing the light interrupted by said disc at separate predetermined points to provide a respective one of a pair of signals, wherein the amplitudes of said pair of signals are phase displaced by 90° as light passed by the disc changes recurrently through a cycle of maximum to minimum to maximum intensity as the shaft and disc rotate, a respective reversible counter and a respective digital to analog converter associated with each of said first and second light sources, a source of a first and second reference signal for each sensor, means for comparing the voltage developed by each sensor with one of said first and one of said second reference signals to provide first and second control signals respectively, means responsive to the first control signal associated with one sensor to change the count of the reversible counter associated with the second sensor by a predetermined count, means responsive to the second control signal associated with said second sensor to control the direction of said predetermined count, each of said digital to analog converters responsive to the count of the reversible couner associated therewith to provide an analog signal, each source of light responsive to its associated analog signal to vary its light intensity to regulate the amplitude of the light pulses with respect to said given reference levels.

4,074,129
ELECTRIC GENERATION BY LIGHT-VARIABLE CAPACITANCE

Louis R. O'Hare, 1041 Ponderosa Apt. 2, Fort Collins, Colo. 80521

Filed Mar. 22, 1976, Ser. No. 669,384
Int. Cl.[2] H01J 39/12
U.S. Cl. 250—212 4 Claims



1. An improvement in the method of generating electricity from radiant energy by the use light variable capacitors in a variable capacitance electric generator comprising:

concentrating light energy by reflecting surfaces focusing on a rotable mirror in a vacuum chamber,

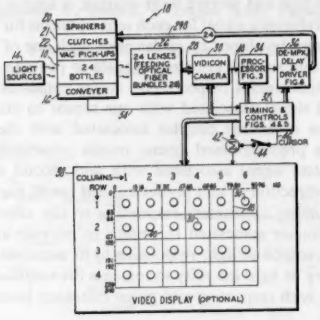
rotating the mirror to rotate the beam of light only upon successive separate light-variable capacitors of separate light-variable capacitance generators, thereby preventing electric interactions between light-variable capacitors,

realizing and utilizing separate electric power outputs, one output from each of the separate generators.

4,074,130
LABELED CONTAINER ORIENTATION PROCESSOR

Leonard A. Messman, Brookfield Center; Harold C. Wooding, Jr., Trumbull, and Glenn C. Waehner, Riverside, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 31, 1975, Ser. No. 645,725
Int. Cl.[2] B65G 47/24
U.S. Cl. 250—223 R 7 Claims



1. Apparatus for sensing the rotary orientation of a plurality of illuminated, labeled containers, each rotating at a respective station, comprising:

a plurality of light responsive means, one for each station, each providing intensity signal manifestations of light intensity of respective areas through which successive portions of the peripheral surface of the related container pass as the container rotates at the corresponding station;

sampling means responsive to said light responsive means for sampling said intensity signal manifestations and providing brightness-indicating signals representative of the sampled intensity of said intensity signal manifestation being in excess of a given magnitude;

memory means responsive to said sampling means for storing said brightness-indicating signals in groups, each group including brightness-indicating signals relating to all of the containers within a given time period, and for reading out the stored brightness-indication signals in sets, each set including brightness-indicating signals relating to one of said containers stored during said time period and a plurality of similar, contiguous, preceding time periods;

stop means responsive to said memory means for testing each set of signals read out of said memory means for compliance with a desired pattern and for providing a stop signal related to the orientation of the container when a set of signals conforms to the desired pattern; and

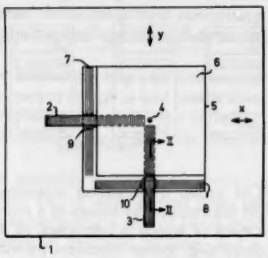
a plurality of delay means, one for each of said stations, each responsive to said stop means to provide an output signal after a pre-established delay from the time of generating said stop signal in response to the testing of a corresponding one of said sets of signals, said pre-established time delay being related to the relative position of the related one of said light responsive means and the desired rotary orientation of the container thereat.

4,074,131
APPARATUS FOR MEASURING OR SETTING TWO-DIMENSIONAL POSITION COORDINATES

Reiner Schwebel, Aalen, Germany, assignor to Carl Zeiss-Stiftung, Oberkochen, Germany

Filed May 3, 1976, Ser. No. 682,504
Claims priority, application Germany, May 15, 1975, 2521618
Int. Cl.[2] H01J 3/14
U.S. Cl. 250—237 G 15 Claims

1. A device for measuring or setting two-dimensional position coordinates of an object, comprising a movable object-bearing slide and a support for said slide, means coacting between said slide and said support for limiting their relative displacement to non-rotational displacement in essentially a single plane, two elongate measurement grids fixedly disposed on said support at right angles to each other and parallel to said plane, the point of intersection of the alignments of said grids coinciding with a measurement mark and each of said grids cooperating with a separate reading index carried directly by said object-bearing slide, the reading index for each coordinate

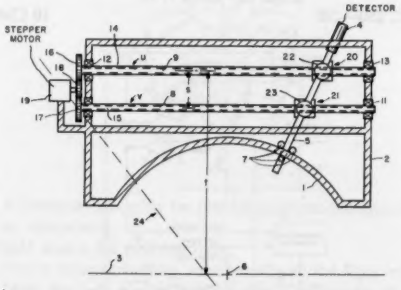


direction being an elongate scanning grid of an effective length which is substantially the measurement length of the other coordinate direction, each of said grids comprising only a single set of parallel lines which are oriented parallel to one or the other of orthogonally related components of the non-rotational displacement, and a photoelectric sensor associated with each scanning grid for detecting position with respect to the associated measurement grid, whereby each sensor may provide a digit-countable output signal indicative of the component of displacement scanned thereby.

4,074,132
AUTOMATIC SINGLE CRYSTAL DIFFRACTOMETER

Joshua Ladell, Monsey, N.Y., and Gerald Kennedy Pitcher, Old Lyme, Conn., assignors to North American Philips Corporation, New York, N.Y.

Filed Aug. 24, 1976, Ser. No. 717,372
Int. Cl.[2] G01N 23/20
U.S. Cl. 250—277 R 6 Claims

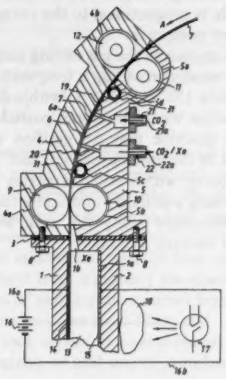


1. In a diffractometer for the acquisition of crystallographic data from a single crystal including means to rotatably mount the crystal in the path of a beam of x-rays, an arc mounted on a frame for rotation about a horizontal axis, a detector moveable along said arc, and means to constrain the movement of the crystal and the detector so that the detector is sequentially positioned along a line of the reciprocal lattice of the crystal, the improvement wherein means are provided to constrain translation of the detector on the arc while the arc itself rotates about the horizontal axis said constraining means being a double lead screw arrangement to which the detector is coupled.

4,074,133
IONOGRAPHY IMAGING CHAMBER

Jürgen Müller; Alfred Rheude, and Manfred Schmidt, all of Munich, Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Sept. 7, 1976, Ser. No. 720,577
Claims priority, application Germany, Sept. 11, 1975, 2540404
Int. Cl.[2] G03B *41/16*
U.S. Cl. 250—315 A **14 Claims**

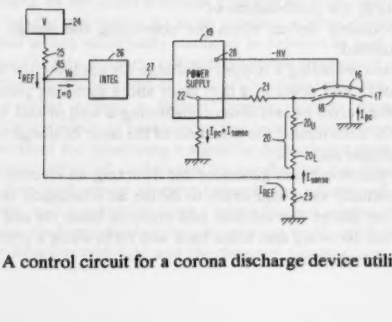


1. In an X-ray apparatus, a combination comprising an ionography imaging chamber defining an interelectrode gap and having a channel for introduction of insulating charge-receiving media into and for withdrawal of such media from said gap; a source of high Z gas; means for conveying compressed high Z gas from said source into said gap and vice versa; a source of compressed buffer gas which is readily separable from said high Z gas; means for admitting compressed buffer gas from the respective source into at least one first portion of said channel whereby the buffer gas flows in said channel toward and away from said gap and the buffer gas flowing toward said gap mixes with high Z gas which normally fills at least a portion of said channel intermediate said gap and said first portion of said channel; and means for evacuating the mixture of buffer gas and high Z gas from at least one second portion of said channel intermediate said gap and said first portion of said channel, said evacuating means comprising a device for maintaining the gases in said second portion of said channel at a pressure which is less than the pressure of buffer gas in said first portion of said channel.

4,074,134
OPERATING POINT REGULATION FOR A CORONA DISCHARGE DEVICE

Howard John Roalson, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 13, 1976, Ser. No. 676,586
Int. Cl.[2] H01T *19/04*
U.S. Cl. 250—324 **4 Claims**



1. A control circuit for a corona discharge device utilized to produce a uniform charge on an electrophotographic imaging member comprising:

a direct current power source having a high voltage terminal and a common terminal;

a corona generating device having a plurality of corona emission wires and a screen member between said corona wires and said imaging member;

means for connecting said high voltage terminal to said corona wire to produce corona emission;

means for connecting a first resistor between said screen electrode and said common terminal of said power source to produce a predetermined screen current;

means for connecting said screen electrode to a summing point over a circuit path including a sense resistor to produce a sense current;

a direct current power source for producing a reference current and circuit means to couple this reference current to said summing point;

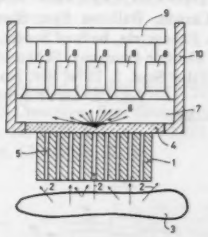
circuit means for connecting a summing resisitor from said summing point to a reference potential to produce an error voltage proportional to the difference between said sense current and said reference current; and

means responsive to said error voltage to adjust the high voltage output inversely with the variation of the sense current.

4,074,135
GAMMA CAMERA IN WHICH ONLY THE THREE LARGEST SIGNALS ARE USED FOR POSITION DETERMINATION

Petrus Franciscus Stevens, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 17, 1975, Ser. No. 623,394
Claims priority, application Netherlands, Oct. 21, 1974, 7413741
Int. Cl.[2] G01T *1/20*
U.S. Cl. 250—366 **5 Claims**

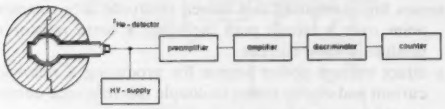


1. A scintillation camera comprising a scintillation crystal, a matrix of detectors viewing overlapping areas of said crystal, an output signal being associated with each detector, means for comparing the amplitudes of said output signals and for selecting a predetermined number thereof having the greatest amplitude, and computing circuitry for computing the position of a scintillation produced in said crystal from the selected predetermined number of output signals, thereby to improve spatial resolution by using for position calculation only the information contribution from a predetermined number of detectors situated nearest to the scintillation.

4,074,136
APPARATUS FOR DETERMINING THE DOSE EQUIVALENT OF NEUTRONS

Max Heinzelmann; Fritz Rohloff, and Hans Schüren, all of Julich, Germany, assignors to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany

Continuation-in-part of Ser. No. 617,397, Sept. 29, 1975, abandoned. This application Feb. 8, 1977, Ser. No. 766,773
Claims priority, application Germany, Oct. 8, 1974, 2447817
Int. Cl.² G01T *3/00*
U.S. Cl. 250—392 **5 Claims**

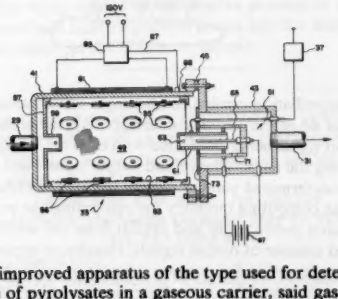


1. An apparatus for obtaining an indication of the dose equivalent independent of the energy of the neutrons and dose rate equivalent of neutrons without registering any thermal neutrons, which includes in combination: a detector operable to absorb neutrons and to emit voltage pulses, a mantle surrounding said detector having only a single moderator layer for moderating purposes and for absorbing neutrons, amplifying means following and in series with said detector for amplifying the voltage pulses emitted by said detector, a voltage discriminator arranged to receive the amplified voltage pulses, recording means following and arranged in series with said voltage discriminator for registering the time average number of the voltage pulses emitted by said voltage discriminator withholding voltage impulses while said detector for neutrons with energies up to at least 10^6 eV emits voltage pulses the height of which depends both on the energy freed by the nuclear processes initiated by the absorbed neutrons and on the kinetic energy of the absorbed neutrons, and while the number of the voltage pulses with a height located within the range of the energies freed in the nuclear processes is at a maximum, said voltage discriminator having the height of the voltage threshold located above the height of the voltage of the by far greatest number of the voltage pulses distributed about said maximum, that part of said mantle which faces said detector comprising a cadmium layer having a thickness of from 0.1 to 2 millimeters to preclude thermal neutrons.

4,074,137
HEATED ION CHAMBER DETECTOR FOR A DYNAMOELECTRIC MACHINE

Chester C. Carson, Ballston Spa; Sterling C. Barton, and Federico S. Echeverria, both of Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sept. 2, 1976, Ser. No. 719,838
Int. Cl.² G01T *1/18*
U.S. Cl. 250—380 **2 Claims**



1. An improved apparatus of the type used for detecting the presence of pyrolysates in a gaseous carrier, said gaseous carrier being a coolant gas sample from a gas cooled dynamoelectric machine wherein certain machine parts are coated with selected materials which will decompose at an elevated temperature to produce said pyrolysates indicative of localized overheating of dynamoelectric machine parts; said apparatus comprising an outer shell including a gas mixing and ionizing section and a detector section, said detector section receiving said ionized gas sample from said gas mixing and ionizing section, said detector section including spaced electrodes having an applied voltage between which current flow occurs by means of the ionized gas to produce a variable signal the magnitude, of which, is proportional to the current flow; wherein the improvement comprises:

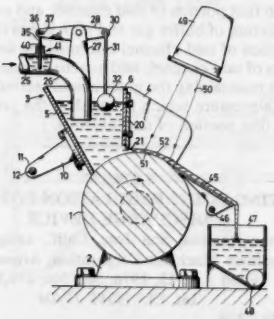
heater means applied to the gas mixing and ionizing section, said heater means providing a temperature range of from approximately 150° C to 250° C within the gas mixing and ionizing section whereby oil mist particles from the dynamoelectric machine may be gasified without affecting pyrolysates in the gaseous carrier; and,

a radiation source within said gas mixing and ionizing section comprising a plurality of discrete radioactive ceramic elements supported along the axial length of said gas mixing and ionizing section.

4,074,138
APPARATUS FOR TREATING LIQUID SLUDGE MATERIAL

Ernst Bosshard, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Feb. 25, 1975, Ser. No. 552,936
Claims priority, application Switzerland, Dec. 23, 1974, 17238/74
Int. Cl.² G01N *21/24, 21/26, 23/10, 23/20*
U.S. Cl. 250—435 **10 Claims**



1. In an apparatus for treating sludge with electron beam radiation, the combination of

a rotatably driven drum for conveying the sludge to be treated;

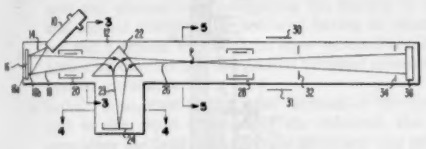
means including a hopper of sludge for applying the sludge onto said drum in a thin layer and a metering plate near the vertex of said drum constituting a wall of said hopper for determining the thickness of the layer of sludge on said drum; and

an electron beam generator for directing an electron beam radially onto said drum to define an irradiation zone on the sludge carried past said electron beam on said drum and to swing said beam back and forth along a generatrix of said drum.

4,074,139
APPARATUS AND METHOD FOR MASKLESS ION IMPLANTATION

Jacques Isaac Pankove, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,685
Int. Cl.[2] H01J 37/30; H01L 21/72, 21/265
U.S. Cl. 250—492 A 7 Claims



1. A method of implanting a dopant material into a substrate of semiconductive material in a preselected pattern without utilizing a mask, said method comprising the steps of:

forming a source template having at least one dopant material formed thereon in said preselected pattern;

sputtering ions of said dopant material from said template by ion bombardment from a primary ion source;

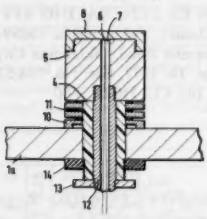
filtering said ions of said dopant material from ions of other materials by means of an ionic filter; and

implanting said ions of said dopant material into said substrate in the pattern of said source template.

4,074,140
ARRANGEMENT FOR MEASURING TEMPERATURES OF WORKPIECES TO BE TREATED BY GLOW DISCHARGE

Bernd Edenhofer, Cologne, Germany, assignor to Ionit Anstalt Bernhard Berghaus, Vadus, Liechtenstein

Filed Feb. 16, 1977, Ser. No. 769,164
Claims priority, application Germany, Feb. 18, 1976, 2606453
Int. Cl.[2] G21K 5/08
U.S. Cl. 250—492 R 10 Claims

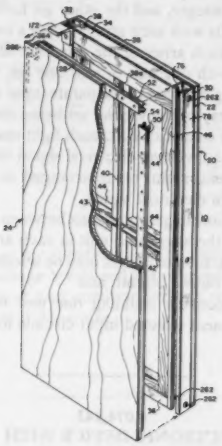


1. In an arrangement for measuring temperatures of workpieces to be treated by glow discharge a combination comprising a container for receiving a treating gas or gas mixture and a charge of one or more workpieces to be treated; means for establishing an electrical potential gradient between said container and the workpiece so as to produce a glow discharge field; and means electrically-insulated in relation to said container and having the same potential than the workpiece(s) for indicating the temperature of the workpiece(s), including heat sensing means having a thermal sensor element mounted within the testpiece in heat-conducting relationship therewith and operative for generating a signal in dependence upon the temperature detected, and means for conducting the detected signal from said sensor element towards the exterior of said container, said conducting means being located remote from said glow discharge field to thereby prevent undesirable interference between said field and the detected signal.

4,074,141
PREFABRICATED X-RADIATION PROTECTION PANELS

Frank E. Bryant, 28 Honeybear Lane, Romeoville, Ill. 60441

Filed Apr. 23, 1976, Ser. No. 679,836
Int. Cl.[2] G21F 3/04
U.S. Cl. 250—517 9 Claims



1. A shielded wall panel assembly comprising:

a rectangular frame including a pair of vertical side channel members and a pair of horizontal top and bottom channel members secured together with their bight portions facing toward one side and with their open sides defining an elongated slot facing toward the other side;

an outside finish panel with an inner lead sheath secured to the bight portions of said channel members;

an inside finish panel having a snap-on fastening member extending along and contiguous to each of the edges of the inner side thereof;

said fastening members each defining a pair of spaced flanges adapted to snap-fit within the respective open sides of said channel members;

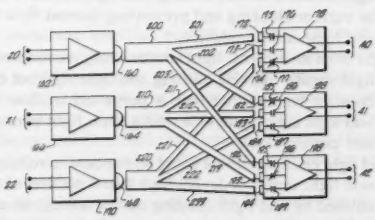
the outer legs of said channel members on opposite sides of said frame being substantially contiguous to the edges of said panels; and

means for securing said outer legs of said channel members to an adjacent structure.

4,074,142
OPTICAL CROSS-POINT SWITCH

Albert S. Jackson, 1335 Crestview, Seal Beach, Calif. 90740

Filed Sept. 10, 1975, Ser. No. 612,255
Int. Cl.[2] G02B 27/00
U.S. Cl. 250—551 20 Claims



1. In an optical cross-point switch, the combination which comprises:

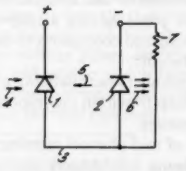
a plurality of separate input circuits;
a plurality of separate output circuits;
an optical matrix connected between the input and output circuits, the matrix including a first set of light emitting units associated with the input circuits and a second set of light sensor units associaed with the output circuits, one of the first and second sets having a number of *n* units, where *n* equals an integer, and the other set having a number of arrays of units with each array having a number of *n* units, one unit in each array of the other set being individually associated with one unit of said one set, each unit of the first set being coupled to a separate input or output circuit and each array of the second set being coupled to a separate input or output circuit, each light emitting unit being arranged to convert an electrical signal into a light signal, each light sensor unit being arranged to convert a light signal into an electrical signal;
means for transmitting light signals between each unit of said one set and the associated unit in each array of the other set so that each input circuit may be selectively coupled to any desired output circuit; and
means for selectively enabling one unit of each array to thereby connect selected input circuits to selected output circuits.

4,074,143

OPTOELECTRONIC DEVICE WITH OPTICAL FEEDBACK

George Hedley Storm Rokos, Hitchen, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 15, 1976, Ser. No. 666,981
Claims priority, application United Kingdom, Oct. 24, 1975, 43925/75
Int. Cl.[2] G01J *1/32*; H01L *9/00*
U.S. Cl. 250—552 **4 Claims**



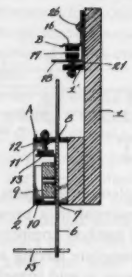
1. A optoelectric device comprising:
a light emitting device,
a light sensitive device coupled directly in series with said light emitting device,
first means for applying a voltage across said series connected devices, said voltage having a polarity such that said light sensitive device is reverse biased and said light emitting device is forward biased, said reverse bias of said light sensitive device causing said light sensitive device to be current blocking and preventing current flow through said light emitting device,
light from an external light source being transmitted to said light sensitive device, causing said light sensitive device to conduct whereby current is permitted to flow through said light emitting device which emits light in response to said current flow,
said light emitting device being so disposed in relationship to said light sensitive device such that a portion of the light emitted by said light emitting device is incident upon said light sensitive device to provide positive feedback whereby said light sensitive device permits additional current flow which provides for more light output from said light emitting device.

4,074,144

SWITCH DEVICE

Mitsuji Kawai, No. 26, 1-chome, Kaname-cho, Toshima, Tokyo, Japan

Filed May 13, 1976, Ser. No. 686,019
Int. Cl.[2] B60K *33/00*
U.S. Cl. 307—10 R **10 Claims**



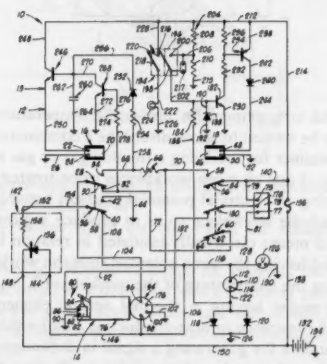
1. A switch device comprising:
two switch mechanisms connected in series in an electric circuit extending between a member to be operated and a power source;
one of said two switch mechanisms including a stationary contact and a movable member having a movable contact, said movable contact being adapted to engage and disengage from said stationary contact;
a magnet attracted to or a spring applied against said movable member;
said movable member being in releasable engagement with a slidable member connected to a vehicle accelerator by means of said magnet or spring; and
the other switch mechanism including a stationary contact and a movable contact for engaging and disengaging from said stationary contact of said other switch mechanism by the slidable movement of said slidable member.

4,074,145

ELECTRIC POWER GENERATING APPARATUS

Perry D. Laffoon, 21 Janice, Yukon, Okla. 73099, and Robert L. Boettcher, 7225 Norman Road, Oklahoma City, Okla. 73132

Filed Apr. 18, 1977, Ser. No. 788,524
Int. Cl.[2] H02J *3/00*
U.S. Cl. 307—10 R **14 Claims**



1. An electric power generating apparatus comprising:
an outlet for connection to an electrical load;
an alternator, having an input terminal for receiving a field current, the alternator having an output terminal con-

nected to the outlet for providing a voltage signal thereto in a driven condition of the alternator;

an auxiliary power unit, mechanically coupled to the alternator, for driving the alternator, the auxiliary power unit comprising a throttle positionable in a first position wherein the auxiliary power unit drives the alternator at a relatively low speed and positionable in a second position wherein the auxiliary power unit drives the alternator at a higher speed;

a solenoid, connected to the throttle of the auxiliary power unit and alternatively positioning the throttle in the first and second positions, the solenoid having an input terminal and a ground terminal, the input terminal receiving an actuating current and the ground terminal connected to a system ground;

a battery connected to the input terminal of the alternator and to the input terminal of the solenoid, the battery providing the field current to the alternator and providing the actuating current to the solenoid; and

a switching assembly, interposed between the battery and the input terminals of the alternator and the solenoid, comprising:

a voltage regulator having an input terminal connected to the battery and an outlet terminal;

a voltage regulation conduit;

a variable resistor; and

a switching circuit comprising:

a first relay having a first relay first contact assembly connected to the input terminal of the alternator, the resistor and the voltage regulation conduit, the first relay first contact assembly connecting the voltage regulation conduit to the input terminal of the alternator in a deactuated state of the first relay and connecting the resistor to the input terminal of the alternator in an actuated state of the first relay;

a second relay, comprising:

a second relay first contact assembly connected to the battery, the resistor, and the input terminal of the solenoid, the second relay first contact assembly connecting the battery to the resistor and to the input terminal of the solenoid in an actuated state of the second relay; and

a second relay second contact assembly connected to the output terminal of the alternator and to the voltage regulator conduit, the second relay second contact assembly connecting the output terminal of the alternator to the voltage regulation conduit in a deactuated state of the second relay; and

relay actuation means for alternatively placing the first and second relays in a deactuated state and placing the first and second relays in an actuated state.

4,074,146

LOAD SHARING MODULAR POWER SUPPLY SYSTEM

Carlos Ernesto Buonavita, South Pasadena, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 593,070, July 3, 1975, Pat. No. 4,032,830.
This application Mar. 1, 1976, Ser. No. 662,636
Int. Cl.[2] H02J *1/04*
U.S. Cl. 307—60 **4 Claims**

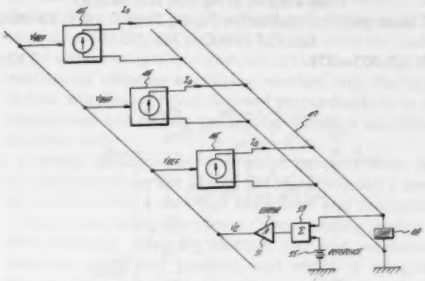
1. A modular power supply system for connection to a power bus supplying a load, said modular power supply system comprising:

a first power supply module connected to said bus which includes current feedback means for maintaining a constant current output, the level of said current output being adjustable in response to a first settable reference voltage level; and

at least a second power supply module connected to said power bus and including current feedback means for maintaining a constant current output, the level of said current output being adjustable in response to a second settable reference voltage level;

means for monitoring the voltage across said load and developing an error signal indicating a departure of the voltage across said load from a desired level; amd

a common voltage reference source means outputting a



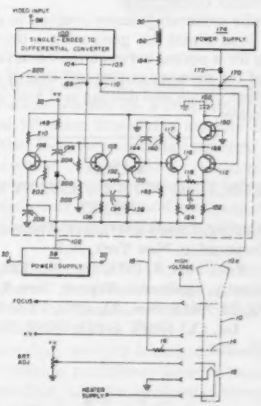
single voltage for supplying said first and second settable reference voltage levels and for responding to said error signal to adjust said common voltage reference to compensate for said departure.

4,074,147

SWITCHING AMPLIFIERS

Carlo Infante, Dallas, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 3, 1976, Ser. No. 747,161
Int. Cl.[2] H03K *1/02*
U.S. Cl. 307—230 **20 Claims**



1. A switching amplifier providing output pulses at a first voltage level and connected to a power supply at a second voltage level greater than the first level, comprising:

input means responsive to a switching signal and connected to the power supply for generating a first output current,

a differentiator coupled to said input means and to the power supply and responsive to the switching signal for generating a second output current,

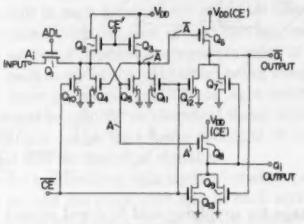
a summing junction for adding the first and second output currents, and

clamping means connected to said summing junction for limiting the amplitude of the output pulses to the first voltage level.

4,074,148
ADDRESS BUFFER CIRCUIT IN SEMICONDUCTOR MEMORY

Takashi Sato, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Filed June 3, 1976, Ser. No. 692,367
Claims priority, application Japan, June 4, 1975, 50-66565
Int. Cl.[2] H03K 3/286, 3/353
U.S. Cl. 307—279 7 Claims



1. An address buffer circuit for a semiconductor memory circuit comprising:

a dynamic flip-flop circuit operated by an operating voltage and including first and second inverters and voltage-driven load means series-connected to the respective inverters, an input node of each inverter being cross-coupled with an output node of the other inverter, said flip-flop circuit receiving an input signal at the input node of said second inverter and providing mutually opposite output signals at the output nodes of said first and second inverters respectively upon application of a driving pulse signal to said load means to couple said inverters to the operating voltage,

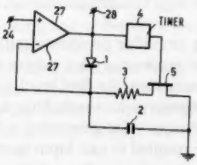
an output circuit including first and second drivers connected to receive the output signals of the flip-flop circuit respectively from the output nodes of said second and first inverters and providing mutually opposite pulse outputs of the buffer circuit, and

driving pulse generating means coupled to control terminals of said load means for generating a driving pulse signal existing for a period between the occurrence of a control signal of the memory circuit and that of a pulse output at said output circuit and driving said load means in conduction thereby.

4,074,149
PEAK DETECTING WITH CONSTANT FRACTIONAL OFFSET

Geert Jan Naaijer, Limeil-Brevannes, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 8, 1974, Ser. No. 522,116
Claims priority, application France, Nov. 9, 1973, 73 39857; Nov. 9, 1973, 73 39858; Nov. 22, 1973, 73 41594
Int. Cl.[2] H03K 5/153; G01R 19/04
U.S. Cl. 307—351 4 Claims



1. A peak detector for detecting peaks of various amplitudes comprising:

difference determining means having first and second inputs and an output;

means for applying an input signal, having signal peaks at successive times and of arbitrary amplitude, to the first input of said difference determining means;

analog storage means, comprising a capacitor having one terminal connected to said second input of said difference determining means for storing an analog reference level derived from the most recent signal peak of said input signal;

charging means connected to the output of said difference determining means and responsive to a latter signal peak having an amplitude greater than the reference level of said analog storage means and operative for charging said capacitor;

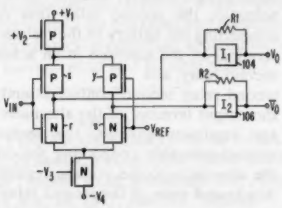
timing means having an input connected to the output of said difference determining means, and an output, said timing means being responsive to the trailing edge of a signal peak received on its input for generating a signal of predetermined duration of its output; and

discharging means having a control input connected to the output of said timing means for partially discharging said capacitor by a predetermined fraction upon termination of an input signal peak for determining said analog reference as a fraction of the most recent signal peak.

4,074,150
MOS INTERCHIP RECEIVER DIFFERENTIAL AMPLIFIERS EMPLOYING RESISTOR SHUNT CMOS AMPLIFIERS

Frederick Buckley, III, Vestal; Malcom Kenneth Creamer, Jr., Endicott, and Gerald Aberdeen Miller, Owego, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 534,950, Dec. 20, 1974, Pat. No. 3,986,041. This application June 30, 1976, Ser. No. 701,385
Int. Cl.[2] H03K 5/20, 17/04, 17/60, 19/08
U.S. Cl. 307—362 6 Claims



1. A high performance digital signal receiver circuit comprising:

an FET differential amplifier having a first input connected to a source signal, a second input connected to a reference voltage, and a differential amplifier output node characterized by a large source capacitance;

a negative feedback amplifier in shunt feedback configuration having its input terminal connected to said differential amplifier output node for providing a low impedance path for current around said capacitance and whose output constitutes the output terminal for said receiver circuit;

said feedback amplifier comprising:

a first P-channel FET device having a source connected to a relatively high supply voltage and a drain connected to said amplifier output terminal and to the drain of a first N-channel FET device having its source connected to a relatively low supply voltage;

said first P-channel FET device having a gate electrode connected to said amplifier input terminal and said first N-channel FET device having a gate electrode connected to said amplifier input terminal;

a resistor connected between said amplifier input and output terminals;

whereby a high speed digital signal receiver is formed.

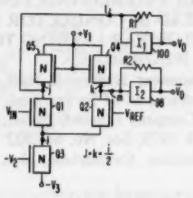
4,074,151
MOS INTERCHIP RECEIVER DIFFERENTIAL AMPLIFIERS EMPLOYING CMOS AMPLIFIERS HAVING PARALLEL CONNECTED CMOS TRANSISTORS AS FEEDBACK SHUNT IMPEDANCE PATHS

Frederick Buckley, III, Vestal; Gerald Aberdeen Miller, Owego, and Vincent Anthony Scotto, Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 534,945, Dec. 20, 1974, Pat. No. 3,986,043. This application June 30, 1976, Ser. No. 701,377

Int. Cl.[2] H03K *5/20, 17/04, 17/60, 19/08*

U.S. Cl. 307—362 **6 Claims**



1. A high performance digital signal receiver circuit, comprising:

an FET differential amplifier having a first input connected to an input signal source, a second input connected to a reference voltage, and a differential amplifier output node characterized by a large source capacitance;

a negative feedback amplifier in shunt feedback configuration having its input terminal connected to said differential amplifier output node for providing a low impedance path for current around said capacitance and whose output constitutes the output terminal for said receiver circuit;

said feedback amplifier further comprising:

a first P-channel FET device having a source connected to a relatively high supply voltage and a drain connected to said amplifier output terminal and to the drain of a first n-channel FET device having its source connected to a relatively low supply voltage;

said first P-channel FET device having a gate electrode connected to said amplifier input terminal and said first N-channel FET device having a gate electrode connected to said amplifier input terminal;

a second N-channel FET device and a second P-channel FET device mutually connected in parallel between said amplifier input and output terminals, with the gate of said second N-channel FET device connected to said relatively high supply voltage and the gate of said second P-channel FET device connected to said relatively low supply voltage;

whereby a high speed digital signal receiver is formed.

4,074,152
ULTRASONIC WAVE GENERATOR

Kiyokazu Asai, and Akihiro Takeuchi, both of Nagoya, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan

Filed Sept. 30, 1975, Ser. No. 620,059

Claims priority, application Japan, Dec. 28, 1974, 49-3508

Int. Cl.[2] H01L *41/04*

U.S. Cl. 310—334 **13 Claims**

1. An ultrasonic wave generator comprising:

an ultrasonic wave oscillator;

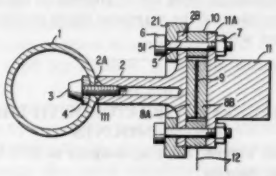
an ultrasonic wave transducer, connected to said ultrasonic wave oscillator, for transforming an electrical oscillation from said oscillator into a mechanical vibration;

a mechanical vibration amplifying member, having one end thereof integrally secured to one end of said ultrasonic wave transducer, for amplifying the amplitude of said mechanical vibration transmitted from said ultrasonic wave transducer;

an ultrasonic vibratory member of a hollow cylindrical body which is open at both ends thereof, which has a side circular wall having a predetermined length between said ends and a constant predetermined wall thickness in the axial direction thereof, and which has its outer circumferential surface integrally connected to the other end of said mechanical vibration amplifying member, with the longitudinal axis thereof being disposed perpendicularly to the longitudinal axis of said mechanical vibration amplifying member; and

an increased thickness portion which projects from said circumferential surface of said ultrasonic vibratory member and/or from a side wall portion of said mechanical vibration amplifying member at the connecting portion of said ultrasonic vibratory member and said mechanical vibration amplifying member, and which is integrally formed upon said ultrasonic vibratory member and said mechanical vibration amplifying member in such a manner that the cross-sectional area of said connecting portion of said ultrasonic vibratory member and said mechanical vibration amplifying member gradually changes,

whereby the mechanical strength of said connecting portion between said ultrasonic vibratory member and said mechanical vibration amplifying member is increased so as to prevent fatigue failure and cracking within said connecting portion, and the positive trnasmission of ultrasonic waves from said mechanical vibration amplifying member to said ultrasonic vibratory member is insured so as to



generate ultrasonic waves from said ultrasonic vibratory member in a stable manner for a long period of time;

said mechanical vibration amplifying member and said vibratory member form two separate members;

said vibratory member of said hollow cylindrical body having a predetermined wall thickness and being integrally secured to the other end of said mechanical vibration amplifying member upon its outer circumferential surface; and

said increased thickness portion is a rib structure provided on at least one of the joint portions of said vibratory member and said mechanical vibration amplifying member along a side wall surface thereof,

whereby said vibratory member is integrally coupled to said mechanical vibration amplifying member through means of said rib structure, and the mechanical strength of said joint portion between said ultrasonic vibratory member and mechanical vibration amplifying member is increased;

said rib structure of said increased thickness portion is integrally formed upon said joint portion of said vibratory member and said mechanical-vibration amplifying member along said outer circumferential surface of said vibratory member in a direction parallel with the longitudinal axis of said vibratory member;

said ultrasonic vibratory member comprises a hollow cylinder provided with said rib structure which has a triangular columnar projection configuration, is integral with the cylindrical wall of said vibratory member, and extends in a direction parallel with the longitudinal axis of said cylindrical body over the entire axial length thereof.

4,074,153

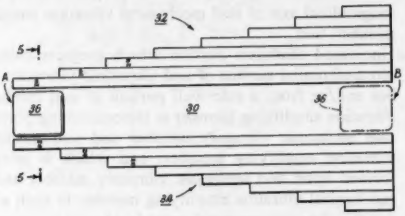
MAGNETIC PROPULSION DEVICE

Daniel Baker, deceased, late of New York, N.Y., by Esther Claire Fuhrer, and Alan W. Borst, 60 E. 42nd St., New York, N.Y. 10017

Division of Ser. No. 218,746, Jan. 18, 1972, abandoned. This application Aug. 26, 1975, Ser. No. 604,463

Int. Cl.[2] H02H *41/00*

U.S. Cl. 310—12 5 Claims



1. A magnetic propulsion device comprising a magnetized propulsion wall composed of a plurality of individual magnets extending continuously from the beginning to the end thereof, each magnet being permanently magnetized through its thickness, a second propulsion wall spaced from said first wall having the same length, linear or radial arcuate, as said first wall and transversely substantially the same beginning and end terminal points, whereby the space defined by said propulsion walls is adapted to receive a magnetized element which is propelled therethrough from the beginning to the end thereof due to the interaction of the magnetic fields produced by said element and said walls.

4,074,154

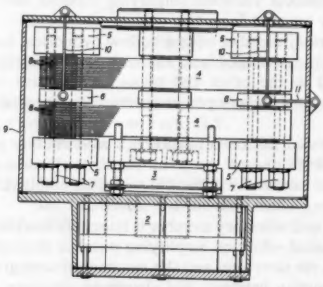
ELECTROMAGNETIC VIBRATOR WITH IMPROVED SPRING MOUNTS

Konrad Kuschel, Vienna, Austria, assignor to IFE Gesellschaft mbH, Vienna, Austria

Filed May 27, 1976, Ser. No. 690,570

Int. Cl.[2] H02K *33/02*

U.S. Cl. 310—29 26 Claims



1. An electromagnetic drive, comprising a first vibratory member which includes an armature; a second vibratory member which includes at least one electromagnet arranged for cooperation with said armature; spring means having spaced end portions and arranged to couple said first and second vibratory members; first connecting means connecting said first vibratory member with said spring means; and second connecting means connecting said second vibratory member with said spring means, at least one of said second connecting means and said second vibratory member being arranged to compensate for at least the predominant part of the changes in spacing between said end portion which occur in response to deflection of said spring means, and said second connecting means being arranged for substantially moment-free transmission of forces from said spring means to said second vibratory member, said second connecting means comprising bar-like members provided in the regions of said end portions, said bar-like members being resistant to bending in longitudinal direction of said spring means and in the direction of vibration of said spring means, and said bar-like members having a low resistance to torsion about an axis extending normal to the vibrational plane.

4,074,155

INTERNALLY AIR COOLED EXCITER-CURRENT LEAD-THROUGH BOLT INTERCONNECTING ROTOR SHAFT-ENCLOSED LEAD-IN CONDUCTOR BAR AND TERMINAL CONDUCTOR BAR LEADING TO ROTOR WINDING

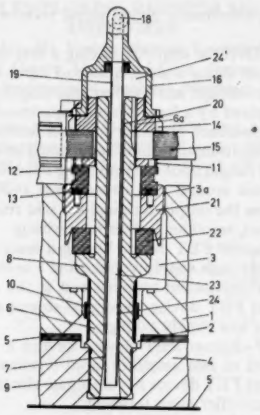
Werner Haditsch, Nussbaumen; Hansruedi Rutz, Wettingen, and Ernst Toplak, Windisch, all of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Dec. 30, 1975, Ser. No. 645,322

Claims priority, application Switzerland, Jan. 16, 1975, 524/75

Int. Cl.[2] H02K *9/00*

U.S. Cl. 310—59 4 Claims

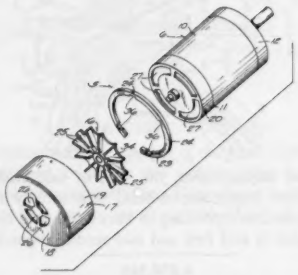


1. The combination with a rotor shaft of a dynamo-electric machine including a longitudinal bore containing an insulated exciter-current lead-in conductor bar and a radial bore extending from said longitudinal bore to the surface of the shaft, of a radially extending exciter-current lead-through bolt mounted in and extending through said radial bore, means securing the radially inner end of said bolt in said lead-in conductor bar, means securing the radially outer part to a terminal conductor bar leading to an exciter winding located on said rotor, and means for cooling said bolt comprising a ventilating tube disposed within a longitudinal bore extending through said bolt, said tube being smaller than the bolt bore to establish a gap between said tube and the wall of the bore, and a ventilating hood mounting the outer end of said ventilating tube and which is mounted atop the radially outer end of said bolt in the ambient air, said hood including a first port extending through the wall thereof placing said gap in communication with the ambient air and a second port placing the outer end of said ventilating tube in communication with the amient air, said ports establishing an air inlet and air outlet respectively thereby to establish a circulating flow path for ambient cooling air in one radial direction through said gap and in the opposite direction through said ventilating tube.

4,074,156
AIR COOLING MEANS FOR DYNAMOELECTRIC MACHINE

John C. Widstrand, Cedarburg, and Dennis J. Jurek, Grafton, both of Wis., assignors to Leeson Electric Corporation, Grafton, Wis.

Filed Apr. 19, 1976, Ser. No. 678,301
Int. Cl.[2] H02K 9/06
U.S. Cl. 310—62 4 Claims



1. A dynamoelectric machine having a wound stator, a frame that encloses the stator and comprises front and rear end members, said frame being substantially imperforate except for axially opening apertures in said end members that provide for circulation of cooling air into and out of the interior of the frame, a rotor having a shaft journaled in bearings in said end members, a cooling fan constrained to rotate with said shaft and located forwardly adjacent to the front end members, and a fan enclosure comprising an apertured front wall forwardly adjacent to the fan and a substantially imperforate circumferential side wall extending rearwardly from said front wall in concentric surrounding relation to the fan, said side wall having a rear portion which is larger in diameter than the frame and which is disposed radially opposite a front portion of the frame all around the same, said machine being characterized by:

air barrier means extending radially across the space between said rear portion of the side wall and said front portion of the frame and circumferentially around at least most of the frame,

said air barrier means cooperating with the frame and with the side wall of said fan enclosure to define an annular plenum chamber in the radially outer portion of said fan enclosure from which pressurized air is mainly constrained to flow into the interior of the frame, and thus through the entire length thereof, by way of said apertures in the end members, while no more than a minor portion of air from said plenum chamber is directed across the exterior of the frame, said air barrier means comprising

an arcuate strip, curved to closely embrace said front portion of the frame and having a radial thickness to extend substantially entirely across the space between said side wall and said front portion of the frame, said strip being secured in said space by fastening means that also secure the fan enclosure to the frame.

4,074,157
PERMANENT MAGNET A.C. SIGNAL GENERATOR

Melvin A. Lace, Prospect Heights, Ill., assignor to Synchro-Start Products, Inc., Del.

Filed Oct. 4, 1976, Ser. No. 729,272
Int. Cl.[2] H02K 3/50
U.S. Cl. 310—67 R 12 Claims

1. The sub-fractional A.C. signal generator comprising:

an annular coil support of insulator material of U-shaped cross-sectional configuration having a plurality of integral alignment bosses on each side wall;

an electrical coil wound upon the coil support;

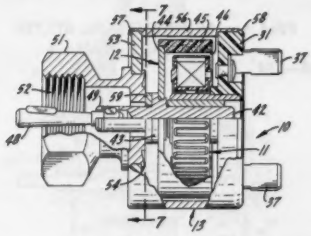
a pair of annular, magnetically permeable stator members of C-shaped cross-sectional configuration, each stator member having a plurality of alignment apertures fitted onto the alignment bosses on one side wall of the coil support to afford a stator sub-assembly, each stator member having a multiplicity of individual pole pieces interleaved one-for-one with the pole pieces of the other stator member around the outer periphery of the stator sub-assembly;

an insulator barrier member;

a cylindrical stator support having a sleeve bearing mounted co-axially therein;

the insulator barrier and the stator sub-assembly being mounted on opposite ends of the stator support to afford a stator assembly;

a drive shaft;



a cylindrical permanent magnet magnetized to afford a multiplicity of magnetic poles, corresponding to the total number of pole pieces on the stator members, facing a central axial opening having a diameter slightly larger than the outer diameter of the stator members;

magnet mounting means mounting one end of the magnet onto the shaft for rotation therewith, to afford a rotor assembly;

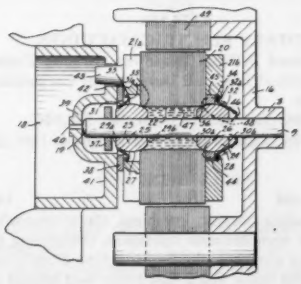
the rotor assembly and stator assembly being joined in a generator by sliding the two assemblies together with the rotor shaft journalled in the stator bearing and the magnet encompassing the stator members but spaced therefrom by a small, uniform radial air gap; and

a housing encompassing both assemblies and maintaining the two assemblies in axial alignment.

4,074,158
ELECTRIC MOTOR ASSEMBLY

James D. Cole, 1651 S. San Luis, Green Valley, Ariz. 85614

Filed May 14, 1976, Ser. No. 686,309
Int. Cl.[2] H02K 5/00
U.S. Cl. 310—90 13 Claims



1. An electric motor assembly comprising:

(a) a stator assembly having a stator winding and an adjacent air gap aperture, and a support member on said stator assembly at one end of said air gap aperture;

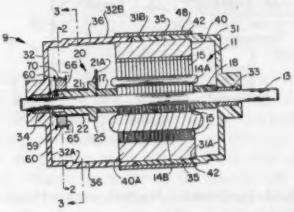
(b) a rotor shaft non-rotatably mounted to said support member and aligned in said air gap aperture;

(c) a rotor assembly having laminations and a central aperture in the laminations, first and second self-aligning bearing means positioned in said central aperture, each bearing means having a curved surface seated at one end against a seating portion formed on the laminations at an end of said central aperture and retained at the other end by a retaining spring abutting a curved surface of the bearing means, said first and second bearing means rotatably engaging said rotor shaft.

4,074,159
DYNAMO-ELECTRIC MACHINE

Russell O. Robison, 103 Plymouth East Road, Plymouth, Ohio 44865

Filed Apr. 16, 1976, Ser. No. 677,758
Int. Cl.[2] H02K *21/28*
U.S. Cl. 310—154 **7 Claims**



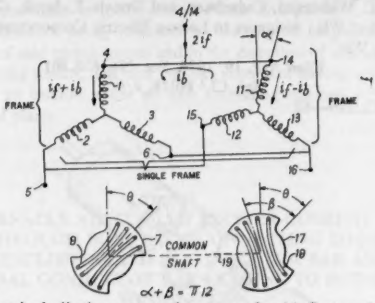
1. In a dynamo-electric machine having housing means, a rotor within the housing, the rotor housing laminations and coil means carried by and rotatable with the rotor, and a cylindrical permanent magnet within the housing and radially outwardly of the laminations and coin means in functional cooperation with the said laminations and coil means, the improvement of said housing means comprising a first and a second shell-like housing having facing open ends and axially aligned cylindrical walls abutted together at said open ends to enclose said rotor, said housings being of plastic material having integral ribs formed on the inner surfaces of said cylindrical walls and extending longitudinally of the housings, said ribs being deformed by said cylindrical permanent magnet pressed axially into said housings through the respective open ends thereof to provide a close frictional fit between the outer cylindrical wall of the permanent magnet and the inner cylindrical walls of both said housings and to provide that said first and second housings are axially aligned, and held assembled together to enclose the rotor, by said permanent magnet inter-engaged by said frictional fit between the permanent magnet and both said housings.

4,074,160
ROTARY ELECTRIC MACHINES

Alexander Richard William Broadway, Bristol, England, assignor to National Research Development Corporation, London, England

Filed July 25, 1975, Ser. No. 598,945
Claims priority, application United Kingdom, Dec. 22, 1972, 59401/72
Int. Cl.[2] H02K *3/00*
U.S. Cl. 310—184 **14 Claims**

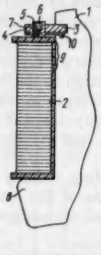
1. An alternating-current, burshless, stator-controlled electric motor, for asynchronous operation, comprising first and second machine elements, the first machine element comprising a first wound stator and a first rotor, said second machine element comprising a second wound stator and a second rotor, both said first and second rotors having rotor asymmetry in two axes electrically at right-angles, said first and second wound stators being connected together electrically in parallel and coupled together mechanically with an electrical displacement therebetween defining a first electrical displacement, said first and second rotors being coupled together mechanically with an electrical displacement therebetween defining a second electrical displacement, the sum of said first and said second electrical displacements being substantially $\pi/2$ radians so that currents corresponding to backward field components are in antiphase in said first and said second wound stators.



4,074,161
POLE ASSEMBLY OF A DYNAMOELECTRIC MACHINE

Vasily Mikhailovich Minichev, Kubinskaya ulitsa, 64, kv. 8; Evgeny Moiseevich Simis, 7 Sovetskaya ulitsa, 15/19, kv. 1, and Vladimir Konstantinovich Judin, Kuznetsovskaya ulitsa, 10, korpus 3, kv. 55, all of Leningrad, U.S.S.R.

Filed Mar. 18, 1976, Ser. No. 668,187
Int. Cl.[2] H02K *3/46*
U.S. Cl. 310—194 **5 Claims**



1. A pole assembly of a dynamoelectric machine, comprising:

a core having slots and a shoulder;

an induction coil received about said core, the coil having a first and a second bearing surface, the second bearing surface abutting against said shoulder of said core;

abutment strips inserted in said slots, said strips having threaded openings;

lock washers retaining said abutment strips in the respective slots; and

tightening bolts threadedly received in said threaded openings, said bolts having their ends abutting against said first bearing surface of said coil.

4,074,162
BRUSH SPRING ASSEMBLY

Joseph F. Parzych, New Britain, Conn., assignor to Dynamics Corporation of America, Greenwich, Conn.

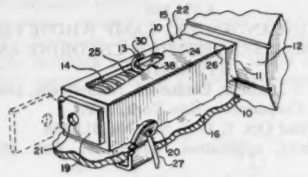
Filed June 24, 1976, Ser. No. 699,482
Int. Cl.[2] H01R *39/40*
U.S. Cl. 310—245 **3 Claims**

1. In an electric motor having a commutator brush assembly comprising:

an elongated brush housing having a longitudinal slot in one rectangular side wall, said slot having a longitudinal side edge inclined as a cam to the longitudinal center line of said side wall;

brush means slidably received in said housing;

a coiled brush spring having an end coil portion to engage the brush and a hook portion extending laterally from the side edge and overlapping the end of the coil and opening towards the brush; and



means interconnecting one side of the hook and the end coil and disposed to engage said inclined edge for it to move the hook progressively into coincidence with the end of said slot as it progresses along said edge with brush wear.

4,074,163

DISCHARGE LAMP WITH HEAT SHIELD

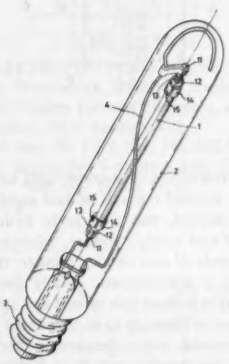
Bart van der Leeuw, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 29, 1976, Ser. No. 653,432

Claims priority, application Netherlands, Mar. 19, 1975, 7503243

Int. Cl.[2] H01S *61/52*

U.S. Cl. 313—13 **3 Claims**



1. A discharge lamp which comprises an elongated discharge tube, first and second electrodes disposed at opposite ends of said discharge tube, a heat shield, and means carrying said heat shield in electrical insulated relation with respect to said first and second electrodes; said means for carrying including a bimetallic element which positions said heat shield in either a first position in proximate relation to said discharge tube substantially at the coldest spot of said tube or a second position in further spaced relation with respect to said discharge tube, said heat shield being normally in said first position following a period in which said lamp is in a steady state off condition and normally in said second position after steady state operation of said lamp.

4,074,164

SUN LAMP

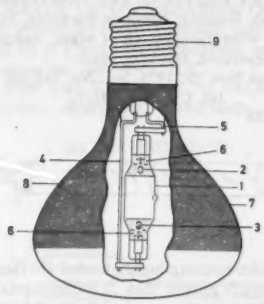
Helmut Leyendecker, Taufkirchen, Germany, assignor to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH, Munich, Germany

Filed Mar. 24, 1977, Ser. No. 780,980

Claims priority, application Germany, Apr. 15, 1976, 2616893

Int. Cl.[2] H01J *61/34, 61/40, 61/20*

U.S. Cl. 313—25 **10 Claims**



1. A sun lamp comprising an arc tube integrally mounted within a surrounding ultraviolet transmissive envelope, said arc tube comprises a halogen metal vapor discharge lamp containing mercury and (i) at least one rare earth metal halide or (ii) iron halide; said ultraviolet light transmissive envelope comprising glass having a spectral transmission factor of approximately zero at 280 nm, of about 30% at 300 nm, and maximum transmittance being attained at above 350 nm, said sun lamp transmitting radiation having a ratio of UV-A to UV-B substantially the same as sunlight with the radiation in the UV-C region being so small as to be harmless.

4,074,165

DECORATIVE LIGHT SOURCE INCLUDING A DISCHARGE LAMP AND RESISTOR WITHIN AN OUTER ENVELOPE

Hideo Moriyama, Tokyo, Japan, assignor to Moriyama Sangyo Kabushiki Kaisha, Tokyo, Japan

Filed May 7, 1976, Ser. No. 684,253

Claims priority, application Japan, May 23, 1975, 50-62384; Oct. 17, 1975, 50-125045

Int. Cl.[2] H01J *61/34, 61/35, 61/40, 61/56*

U.S. Cl. 313—112 **20 Claims**

1. An illuminating device used for decorating purposes which comprises:

a base for electrical and mechanical connection to a socket;

a discharge bulb;

a discharge control element for said discharge bulb;

supporting wires to support said discharge bulb and said discharge control element;

a flame-shaped member mounted over said discharge bulb; and

a light transmitting envelope separately comprised of a lower neck part, one end of which is adapted to be received in said base, and an upper enveloping part being attached to the other end of said lower neck part, for covering said discharge bulb, said discharge control element and said supporting wires therewithin.

4,074,166

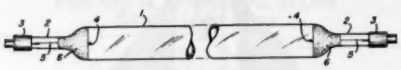
ULTRAVIOLET EMITTING ARC DISCHARGE LAMP

Edward A. Webb, Reading; Nikolaos Barakitis, Haverhill, and Keith Pigott, West Peabody, all of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Nov. 19, 1976, Ser. No. 743,265

Int. Cl.[2] H01J *61/12*

U.S. Cl. 313—185 **3 Claims**



1. An ultraviolet-emitting highly loaded arc discharge lamp having an arc length greater than 36 inches containing an arc tube fill of mercury, inert gas and niobium, the inert gas pressure being between about 8–10 torr, the amount of niobium being adequate to stabilize the arc.

4,074,167

HALOGEN INCANDESCENT LAMP

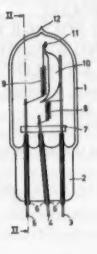
Cornelis Pieter van den Broek, and Johannes Maria Josephus van Lieshout, both of Eindhoven, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Nov. 16, 1976, Ser. No. 742,343

Claims priority, application Netherlands, Nov. 18, 1975, 7513429

Int. Cl.[2] H01J *5/50*

U.S. Cl. 313—222 **5 Claims**



1. A halogen incandescent lamp which comprises: a lamp vessel of a high-melting-point transparent material which is resistant to halogen, at least three molybdonum internal current conductors disposed in said vessel, at least two tungsten filaments stretched between said internal current conductors, said lamp vessel comprising a vacuum-tight seal having a plurality of current leadthrough conductors incorporated therein which are each in electrical contact with one of said internal current conductors, a plurality of external current conductors extending outside said lamp vessel, each of said external current conductors being connected to one of said leadthrough conductors, said lamp vessel being filled with a halogen-containing inert gas, said lamp vessel consisting of an alkali-alumino-borosilicate glass having a coefficient of expansion of $31 - 37 \times 10^{-7}$° C^{-1} at 0°–300° C, said internal current conductors being a molybdenum wire having a minimum diameter of 400 microns, a glass bead of the kind of glass from which the material of the lamp vessel is selected being disposed in surrounding vacuum tight relationship to at least the part of each of said molybdenum wires which extend in said vacuum-tight seal of said lamp, the ratio between the diameter of the molybdenum wires and the wall thickness of the glass bead being larger than 2 and the angles at which the glass of the lamp vessel contacts the glass of the bead, measured through glass, being at most 90°.

4,074,168

HALOGEN INCANDESCENT LAMP WHOSE FILLER GAS COMPRISES BROMINE, CHLORINE AND HYDROGEN

Germain Remi T'Jampens, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 1, 1974, Ser. No. 511,056

Claims priority, application Netherlands, Oct. 10, 1973, 7313906

Int. Cl.[2] H01K *1/50*

U.S. Cl. 313—222 **3 Claims**

1. A halogen incandescent lamp having a transparent sealed envelope, a filament supported therein, and means for supplying electric power to said filament, wherein said envelope contains carbon, hydrogen, bromine and chlorine and a gas selected from the group consisting of the rare gases and nitrogen, the ratio between said carbon, hydrogen, bromine and chlorine in gram atoms being between 1:1:1:2 and 1:1.8:1.8:0.4, and the ratio between hydrogen and bromine differing by less than 10% from 1.

4,074,169

MAGNETRON WITH HARMONIC FREQUENCY OUTPUT SUPPRESSION

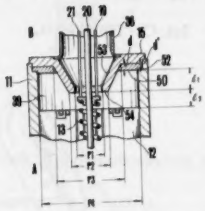
Akikazu Harada, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 12, 1976, Ser. No. 713,859

Claims priority, application Japan, Sept. 19, 1975, 50-112687

Int. Cl.[2] H01J *25/587*

U.S. Cl. 315—39.75 **8 Claims**



1. In a magnetron of the class comprising an anode cylinder, vanes extending toward the axis of said anode cylinder from the inner wall thereof, and a cathode structure positioned along the axis of said anode cylinder, wherein end spaces are defined at both ends of said anode cylinder, the improvement which comprises a non-magnetic axially symmetric annular member disposed in at least one of said end spaces for causing said one end space to resonate to an unwanted frequency other than the fundamental wave frequency thereby preventing unwanted electro-magnetic wave from leaking to the outside of said magnetron.

4,074,170

VOLTAGE REGULATOR WITH THERMAL OVERLOAD PROTECTION

Jean M. Orban, Santa Monica, Calif., assignor to Vivitar Corporation, Santa Monica, Calif.

Filed June 21, 1976, Ser. No. 697,869

Int. Cl.[2] H05B *41/34;* H02H *3/06, 5/04*

U.S. Cl. 315—120 **15 Claims**

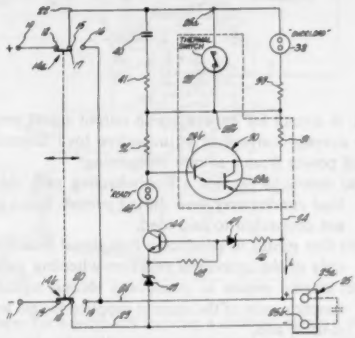
1. A voltage regulator for charging the main capacitor of an electronic flash unit and for preventing the application of energy to the flash unit when the time average electrical

charge applied to the flash unit reaches a potentially damaging level for the flash unit, comprising

a pair of input terminals adapted to be connected to a dc voltage source,

a pair of output terminals adapted to be connected to an electronic flash unit for supplying charging energy to the main capacitor thereof,

circuit means connecting said input terminals with said output terminals, said circuit means including semiconductor feedback regulator circuit means and a thermal switch means connected in series between one of said



input terminals and one of said output terminals, said regulator circuit means including at least one current carrying series component in thermal contact with said thermal switch means for sensing accumulated heat to thereby provide time integration of current supplied through said regulator circuit means and to cause said thermal switch means to open if a predetermined amount of energy is applied to an electronic flash unit connected with said output terminals.

9. A voltage regulator as in claim 1 including

overload indicator means connected in parallel with said thermal switch means.

4,074,171

ELECTRONIC FLASH DEVICE

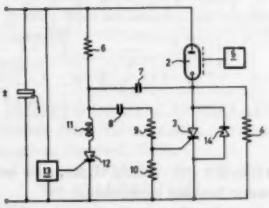
Frederick Arthur Woodworth, Romiley, England, and Ernst-Guenther Zobel, Watten Terrace, Singapore, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 29, 1974, Ser. No. 492,417

Claims priority, application Germany, Aug. 23, 1973, 2339094

Int. Cl.² H05B *37/00*

U.S. Cl. 315—241 P **13 Claims**



1. An electronic flash device comprising, a pair of voltage supply terminals, an electronic flash tube, a first capacitor connected across said supply terminals, a thyristor, means connecting the series arrangement of the flash tube and the thyristor across the electrodes of the first capacitor, means including said thyristor for initiating a flash of light in said flash tube, a flash duration limiter comprising a series arrangement of a second capacitor and an electronic switch connected in shunt with the thyristor, said flash duration limiter normally producing a light spike in the flash tube upon operation of the electronic switch, and means for inhibiting said light spike comprising a rectifier connected in shunt with the thyristor with its pass direction opposite to that of the thyristor.

4,074,172

DISCHARGE LAMP OPERATING CIRCUIT

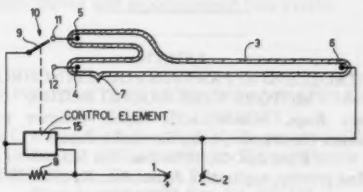
Gustaaf Adolf Wesselink; Hendrik Roelofs, and Gijsbert Johannes Ponsen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 3, 1976, Ser. No. 663,488

Claims priority, application Netherlands, Apr. 1, 1975, 7503824

Int. Cl.² H05B *41/36*

U.S. Cl. 315—307 **9 Claims**



1. A device having a lamp which is provided with a metal vapor discharge tube having an elongated discharge tube having first end and a second bifurcated end having first and second legs; first, second, and third electrodes; said first electrode being disposed in said first leg, said second electrode being disposed in said second leg and said third leg being disposed in said first end; a reservoir of metal of the type which has a vapor which in the operating condition of the lamp participates in the discharge; a switch; means automatically operating said switch responsive to the magnitude of the lamp current; said discharge tube being operated substantially ballastless, said switch being connected to a source of electrical power and having a first position in which the first electrode is switched off and the second electrode of the discharge tube is switched on and a second position in which the first electrode is switched on and the second electrode is switched off, means positioning said switch in said second position of said switch at relatively low lamp current values, said reservoir being so disposed that the coldest spot of the discharge tube is present in said reservoir in the operating condition of the lamp.

4,074,173

ELECTRIC MACHINE

Johannes Hendrikus Hubertus Janssen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 28, 1976, Ser. No. 653,084

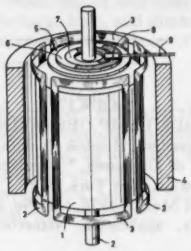
Claims priority, application Netherlands, Mar. 14, 1975, 7503046

Int. Cl.² H02K *29/00*

U.S. Cl. 318—138 **12 Claims**

1. An electric machine including an electronic commutator comprising, a magnetic rotor, a plurality of stator coils disposed in flux-coupling relation to said rotor, switching means for selectively applying electric current to the stator coils as a function of the rotor position, a member coupled to the rotor to rotate in synchronism therewith and comprising a plurality of magnetically coded tracks disposed thereon, and a plurality of

magnetosensitive elements individually arranged in magnetic coupling relationship with said magnetically coded tracks for



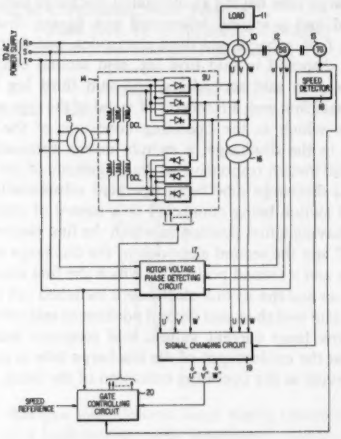
selectively operating said switching means as determined by the rotor position.

4,074,174

CONTROLLING APPARATUS FOR ASYNCHRONOUS MOTORS WITH WOUND ROTOR

Katutaro Kuge, Mizuhomachi, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Jan. 28, 1976, Ser. No. 653,197
Claims priority, application Japan, Jan. 31, 1975, 50-14390[U]
Int. Cl.² H02P *1/26*
U.S. Cl. 318—197 **11 Claims**



1. A controlling apparatus for a supersynchronous Scherbius apparatus to enable wound rotor type induction motors to have a smooth speed control below and above the synchronous speed comprises

first detecting means for detecting a signal corresponding to the rotating magnetic field of the induction motor,

second detecting means for detecting a signal corresponding to the position of the rotor,

calculating means for generating a signal corresponding to the phase of the secondary voltage in accordance with the signals of the first and the second detecting means,

power converting means for reversibly converting the power of a secondary winding of the induction motor to the power of an A.C. power supply, and

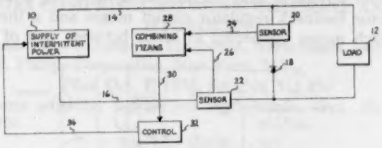
power controlling means for controlling the power converting means in accordance with the signal of the calculating means.

4,074,175

INDUCTIVE LOAD CURRENT MEASURING CIRCUIT

Norman E. Born, and Edwin E. Kolatorowicz, both of Erie, Pa., assignors to General Electric Company, Erie, Pa.

Filed Apr. 15, 1976, Ser. No. 677,195
Int. Cl.² H02P *5/00*
U.S. Cl. 318—332 **18 Claims**



1. A circuit for generating an output signal proportional to the average current of an inductive load intermittently supplied power from a source comprising:

(a) means to provide a free-wheeling path through which load current may flow during periods when said source is not connected to said load;

(b) first means to produce a first signal which is a function only of the current in said free-wheeling path;

(c) second means to produce a second signal which is a function only of the current supplied to said load from said source; and,

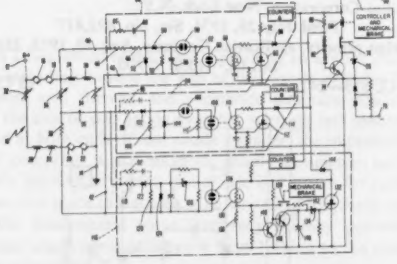
(d) means to combine said first and second signals to provide said output signal proportional to the average load current.

4,074,176

MOTOR PROTECTOR

Harry G. Parke, Brooklyn, and Harry W. Tomsky, Bronx, both of N.Y., assignors to Marine Electric Corporation, Brooklyn, N.Y.

Filed June 7, 1976, Ser. No. 693,483
Int. Cl.² H02P *3/26*
U.S. Cl. 313—371 **27 Claims**



1. Apparatus for preventing damage to an electric motor during dynamic braking comprising:

sensing means for electrically detecting dynamic brake voltage of the electric motor;

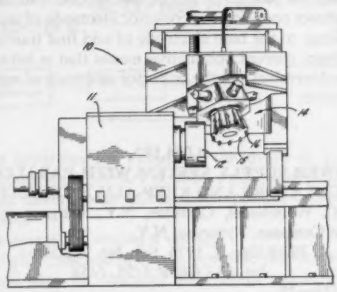
means responsive to said detected dynamic brake voltage for generating an output whenever said voltage exceeds a predetermined value; and

means responsive to the output of said voltage responsive means for interrupting dynamic braking and substituting mechanical braking therefor whereby damage to the motor by excessive dynamic braking voltages may be prevented.

4,074,177
METHODS AND APPARATUS FOR AUTOMATIC MOVEMENT OF A MEMBER TO PRECISELY INDEXED POSITIONS DESPITE SIGNAL DRIFT OR OFFSET

Eugene A. Olig, Fond du Lac, Wis., assignor to Giddings & Lewis, Inc., Fond du Lac, Wis.

Filed July 17, 1975, Ser. No. 596,586
Int. Cl.² G05B *19/28*
U.S. Cl. 318—602 **11 Claims**



1. In a system for selectively moving a member along a path to various ones of a plurality of predetermined index positions, in response to respective index position command signals, for precise lock-up, the combination comprising

means for releasably locate-locking said member in any one of said index positions when the member is within a given proximity (B) of that one position,

means energizable when said locking means are released for moving said member along said path,

means for producing a position command signal (TCC) which from time to time is changed to represent different ones of the predetermined index positions by different predetermined respective values thereof,

means for sensing the position of said member and producing a feedback signal (TAC) nominally representing the member's actual position along the path, but said signal being subject to drift and inaccuracy,

means operative only when said member is locked in an index position for producing and storing a correction signal (TOC) representing the difference (TAC−TCC) between said feedback signal and the predetermined value for the command signal then obtaining, and

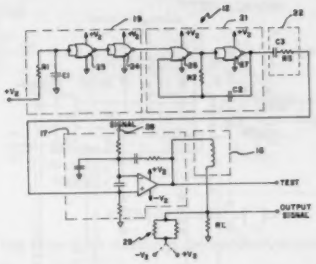
means responsive to said command, feedback and correction signals for (a) releasing said locking means, (b) and energizing said moving means when the algebraic sum (TCC − TAC + TOC) of such three signals is in absolute magnitude greater than an amount corresponding to said given proximity (B).

4,074,178
TIME LIMITED DIGITAL OSCILLATOR

Gerald Shelton Bower, Paso Robles, Calif., assignor to Systron-Donner Corporation, Concord, Calif.

Filed Dec. 29, 1975, Ser. No. 644,758
Int. Cl.² G05B *11/01*
U.S. Cl. 318—631 **10 Claims**

1. A digital oscillator responsive to application of a DC power signal for exciting an electrical device, comprising a gating circuit coupled to receive the DC power signal and providing an output responsive thereto, means coupled to said gating circuit for changing the output therefrom at the end of a predetermined time period after application of the DC power signal, an astable multi-vibrator for receiving the output from said gating circuit, said astable multi-vibrator providing a series of unipolar signal pulses during said predetermined time period, and means for converting said series of unipolar signal pulses to a series of bipolar signal pulses and for coupling said series of bipolar signal pulses to the electrical device, whereby

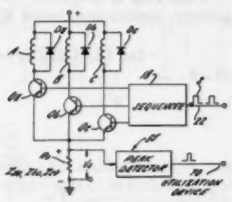


the electrical device is driven bidirectionally by said bipolar signal pulses during said predetermined time period.

4,074,179
POSITION DETECTION METHODS AND APPARATUS FOR STEPPING MOTORS

Benjamin C. Kuo; John R. Frus, both of Champaign, and Gurdial Singh, Urbana, all of Ill., assignors to Warner Electric Brake & Clutch Company, Rockford, Ill.

Filed June 16, 1975, Ser. No. 587,107
Int. Cl.² H02K *37/00*
U.S. Cl. 318—696 **55 Claims**



1. The method of confirming that a plural phase stepping motor will reach an equilibrium position corresponding to steady excitation of a phase which has been turned on, said method comprising the steps of (a) sensing the current which flows through a phase, (b) detecting a change in the sign of the slope of said current with respect to time, and (c) producing an output signal in response to said detecting.

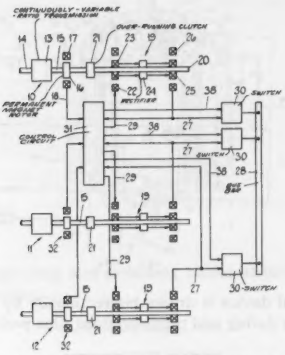
4,074,180
ELECTRIC CURRENT GENERATOR ARRANGEMENTS

Raymond Sharpe, Mirfield, and Kenneth Darnbrough, Bingley, both of England, assignors to Lucas Industries Limited, Great Britain

Filed Feb. 18, 1976, Ser. No. 659,169
Claims priority, application United Kingdom, Feb. 25, 1975, 7754/75
Int. Cl.² H02H *7/06*; H02P *9/00*; H02J *1/00*
U.S. Cl. 322—29 **8 Claims**

1. An electric current generator arrangement comprising a continuously-variable-ratio transmission device having input and output shafts, an electric alternator having a rotor drivingly connected to said output shaft, an electrical generator having a first winding excitable by a voltage derived from the alternating output from said alternator and a second winding from which an output current of said generator can be derived, and an over-running clutch connecting said output shaft and the rotor of said generator so that the speed of said output shaft

may be less than that of siad rotor, and means responsive to the frequency of an electrical output from said alternator for providing an indication of the speed of the output shaft of said transmission.



4,074,181

VOLTAGE REGULATORS OF A TYPE USING A COMMON-BASE TRANSISTOR AMPLIFIER IN THE COLLECTOR-TO-BASE FEEDBACK OF THE REGULATOR TRANSISTOR

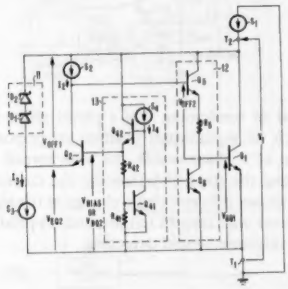
Brian Crowle, Ashford, England, assignor to RCA Corporation, New York, N.Y.

Filed Dec. 2, 1976, Ser. No. 746,887

Claims priority, application United Kingdom, Dec. 4, 1975, 49864/75

Int. Cl.[2] G05F *1/64*

U.S. Cl. 323—8 **21 Claims**



1. A voltage regulator for regulating the voltage applied between its first and second terminals from a source of operating current, said voltage regulator comprising in addition to said first and second terminals the following:

first and second transistors of a first conductivity type, each having base and emitter and collector electrodes;

means connecting said first transistor as a shunt regulator for controlling the potential appearing between said first and said second terminals, which means includes

first direct current conductive means that is between the emitter electrode of said first transistor and said first terminal, and includes

means directly responsive to the collector current of said first transistor for reducing the potential at said second terminal; as referred to the potential at said first terminal; and

a direct-coupled degenerative collector-to-base feedback connection of said first transistor wherein said second transistor is included in common-base amplifier configuration, said feedback connection including for connecting said second transistor in said common-base amplifier configuration:

potential offsetting means for applying a first offset potential between said second terminal and the emitter electrode of said second transistor,

second direct current conductive means that is between the emitter electrode of said second transistor and said first terminal,

means for applying a bias potential between said first terminal and the base electrode of said second transistor;

means direct coupling the collector electrode of said second transistor to the base electrode of said first transistor, and

third direct current conductive means that is between said second terminal and the collector electrode of said second transistor.

4,074,182

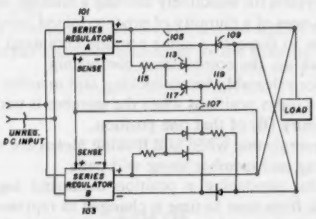
POWER SUPPLY SYSTEM WITH PARALLEL REGULATORS AND KEEP-ALIVE CIRCUITRY

Richard C. Weischedel, Camillus, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Dec. 1, 1976, Ser. No. 746,398

Int. Cl.[2] G05F *1/56, 1/58*

U.S. Cl. 323—25 **9 Claims**



1. A redundant DC power supply system comprising:

(a) a plurality of voltage regulators having a combined power rating in excess of the anticipated load by an amount at least equal to the power rating of at least one of the regulators, each of said regulators having an input for connection to a power source, an output for connection to a load, and control means including a voltage control input for controlling the regulator output to the load;

(b) supply and load conductor means for connecting said regulators in parallel with each other between a source of unregulated input voltage and a common load;

(c) unidirectional current flow means interposed in one of said load conductor means between each of said regulators and said common load for permitting current flow to the load from at least the one of said regulators having the highest output voltage and preventing current flow from the load to any other of said regulators;

(d) keep-alive circuit means associated with at least one of said regulators including first diode and first resistance means connected in series relation with each other across said conductor means between said one regulator and said load with the point of connection to the one of said load conductor means having interposed therein said unidirectional current flow means being on the regulator side thereof, and second diode and second resistance means connected in series relation with each other with said second diode means being connected to the point of connection of said first diode and resistance means and said second resistance means being connected to said one load conductor means on the load side of said unidirectional current flow means, whereby current may flow from said load through said second diode means when the regulator output voltage is lower than the load voltage by a predetermined amount; and

(e) means responsive to current flow in said second diode means for applying to the voltage control input of said one

regulator a control signal effective to cause that regulator to maintain an output voltage of predetermined magnitude relative to its rated output.

4,074,183

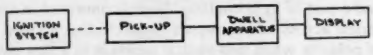
APPARATUS FOR MEASURING THE DWELL OF AN AUTOMOTIVE IGNITION SYSTEM

Zoltan Voross, Chicago, Ill., assignor to Sun Electric Corporation, Chicago, Ill.

Continuation of Ser. No. 587,520, June 16, 1975, abandoned. This application Mar. 31, 1976, Ser. No. 672,484

Int. Cl.² F02P *17/00*

U.S. Cl. 324—16 R **19 Claims**



12. An apparatus for measuring the dwell of an ignition system producing a primary ignition signal, said primary ignition signal having peak and a dwell period, comprising, in combination:

storage means for storing a voltage;

controllably conductive means, operable in a first state and a second state, for charging said storage means in said first state and discharging said storage means in said second state, said controllably conductive means defining a voltage threshold, said controllably conductive means being responsive to said primary ignition signal and operable in said first state whenever said primary ignition signal is substantially within said voltage threshold or 0 volts;

comparator means for comparing said voltage to a comparison voltage, said comparator means being operable in a first comparator state to produce a first output signal and operable in a second comparator state to produce a second output signal;

means for setting said comparison voltage in said first and second comparator states, whereby said comparator means switches to said first comparator state a predetermined time after initiation of said dwell period and switches to said second comparator state in response to said peak;

detector means for detecting a voltage crossing between said first output signal and said second output signal of said comparator means, said detector means producing an output signal in response to said voltage crossings; and

delay means for delaying transmission of said second output signal to said detector means for substantially said predetermined time whenever said comparator means switches from said first comparator state to said second comparator state.

4,074,184

NONCONDUCTIVE VAPOR/SOLID OR LIQUID FRACTION DETERMINATION

Ronald L. Dechene, Boxford; Frank G. Grimaldi, and Robert E. Newton, both of Tewksbury, all of Mass., assignors to Auburn International, Inc., Danvers, Mass.

Continuation-in-part of Ser. No. 719,196, Aug. 31, 1976, and Ser. No. 722,168, Sept. 10, 1976. This application Feb. 22, 1977, Ser. No. 770,821

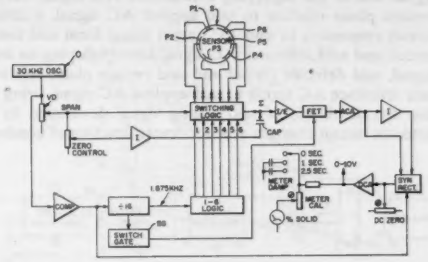
Int. Cl.² G01N *27/42*

U.S. Cl. 324—30 R **9 Claims**

1. Method of measuring phase fractions in mixed flow media of dielectric material, comprising the steps of

applying a cyclic series of relatively displaced voltage fields across the flow in distributed, spatially overlapping, time sequenced, fashion, each with a field of said series being established in tapered form between a relatively narrow input electrode opposing a relatively broad receiving electrode,

summing capacitive currents so produced across the flow by such fields and affected by the flowing medium dielectric constant to produce a signal correlatable with phase fraction of the flow with direction dependent variations averaged out.



4,074,185

METHOD AND APPARATUS FOR MEASURING THE POSITION OF A MAGNETIC ROD

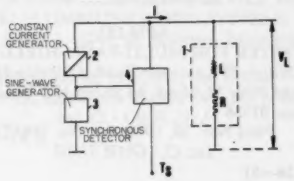
Regis Dardenne, Roselies, Belgium, assignor to ACEC, Ateliers de Constructions Electriques de Charleroi, Charleroi, Belgium

Filed July 30, 1976, Ser. No. 710,106

Claims priority, application Belgium, July 31, 1975, 158795

Int. Cl.² G01R *33/00*

U.S. Cl. 324—208 **4 Claims**



1. A method of measuring a position of a magnetic rod moving along a longitudinal axis of an induction coil, comprising the steps of:

a. feeding the induction coil by means of a constant current AC supply,

b. measuring a resulting voltage appearing across the terminals of the induction coil,

c. measuring a reactive component of said voltage, said reactive component being representative of the position occupied by the magnetic rod in the coil,

d. said reactive component measuring step comprising the step of vectorially multiplying, in phase, the coil supply current with the coil voltage, which is in quadrature with the current, so as to obtain the reactive component value of said voltage.

4,074,186

CONDUCTIVITY MEASURING INSTRUMENT HAVING LINEARIZATION MEANS AND A DIGITAL READ-OUT

John J. Flaherty, Grove Village, Ill., assignor to Magnaflux Corporation, Chicago, Ill.

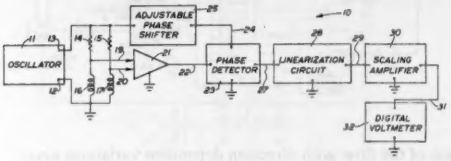
Filed Sept. 19, 1975, Ser. No. 614,877

Int. Cl.² G01R *33/12*

U.S. Cl. 324—222 **7 Claims**

1. In an eddy current instrument for measuring conductivity over a wide range of conductivity values, a test coil circuit including test coil means arranged to be placed in proximity to a part under test, an AC signal source coupled to said test coil circuit for applying thereto an AC signal of a certain frequency, said test coil circuit being operative to develop an AC output signal having an amplitude and a phase shift relative to

said applied AC signal both varying as functions of the conductivity of the part under test, means coupled to said AC signal source for supplying a reference AC signal having a certain phase relation to said applied AC signal, a detector circuit responsive to said AC output signal from said test coil circuit and said reference AC signal for developing an analog signal, said detector circuit and said certain phase relation of said reference AC signal to said applied AC signal being such that the amplitude of said analog signal developed by said detector circuit changes as a non-linear function of conductivity of the part under test while changing progressively and continuously in one direction in response to changes in conductivity of the part under test from one end to the other of said wide range of conductivity values to thereby be a single-valued non-linear function of conductivity, a linearization circuit responsive to said analog signal from said detector circuit for developing an analog output signal varying as a linear function of the conductivity of the part under test, and digital read-out means responsive to said analog output signal of said linearization circuit to provide a digital indication of the conductivity of the part under test.

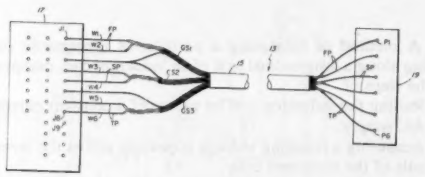


4,074,187

CABLE TESTER FOR MULTI-PAIR SHIELDED CABLES

David H. Miller, 59 Lancaster Road, Arlington Heights, Mass. 02174, and Peter M. Mena, 4 Creeper Hill Road, North Grafton, Mass. 01536

Filed Nov. 30, 1976, Ser. No. 746,071
Int. Cl.[2] G01R *31/02*
U.S. Cl. 324—51 **9 Claims**



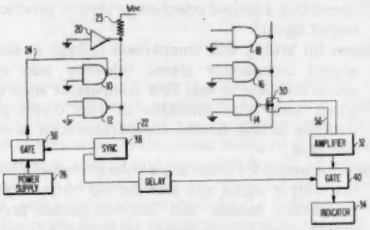
9. Apparatus for testing for shorts, polarity and continuity in a pair of shielded wires from a first termination connected to a first end of said pair of shielded wires to a second termination connected to said second end of said pair of shielded wires, said first termination having first, second and third terminals which should be connected respectively to the first wire, second wire and grounding shield of said pair of shielded wires, said second termination having first and second terminals which should be connected respectively to the first wire and second wire of said pair of shielded wires, said apparatus comprising: a first module and a second module, the first module comprising a battery having positive and negative terminals, a termination having first second and third terminals, adapted to be connected to first, second and third terminals respectively in said first termination, first and second light emitting diodes each having their anodes connected to the positive terminal of the battery, third and fourth light emitting diodes each having their cathodes connected to the negative terminal of the battery and switch means adapted in a first position to connect the first terminal of the termination to the positive terminal of the battery and the anode of the second and third light emitting diodes to the second terminal of the termination and in a second position to connect the first terminal of the termination to the cathode of the first light emitting diode and the second terminal of the termination to the cathode of the fourth light emitting diode, and means connecting the negative terminal of the battery to the third terminal of the termination, said first light emitting diode providing a visual indication of a short between the grounding shield and one of the wires when the switching means is in said second position, said third light emitting diode providing a visual indication of continuity between the pair of wires when said switching means is in a first position and said fourth light emitting diode providing a visual indication of shorts between the two wires when said switching means is in a first position, the second module comprising a termination having first and second terminals adapted to be connected respectively to first and second terminals in said second termination and a pair of light emitting diodes connected in parallel and reversed across said terminals for providing a visual indication of polarity when said switch means is in a first positon.

4,074,188

LOW IMPEDANCE FAULT DETECTION SYSTEM AND METHOD

Roger M. Boatman, and Melvin R. Hall, both of Titusville, Fla., assignors to Testline Instruments, Inc., Titusville, Fla.

Filed Aug. 1, 1975, Ser. No. 601,172
Int. Cl.[2] G01R *31/08, 31/28*
U.S. Cl. 324—52 **23 Claims**



5. A system for isolating a low impedance fault which causes sinking of electric current through a current carrying element on a printed circuit board comprising:

a hand manipulatable probe carrying an inductor element at a location on the probe so as to permit the positioning of the inductor element adjacent the current carrying element on the printed circuit board, the inductor element producing an electrical signal as a function of the first derivative of the magnetic field associated with varying current flow in the current carrying element on the printed circuit board;

means for generating a time synchronization signal in approximate time coincidence with expected variations in current flow in the current carrying element on the printed circuit board;

means for manually selecting an amplitude reference value; and

circuit means connected to receive said electrical signal produced by said inductor element and to indicate the presence of excursions of said electrical signal only in excess of said selected amplitude reference value and in time coincidence with said synchronization signal whereby false indications in response to spurious signals are generally avoided.

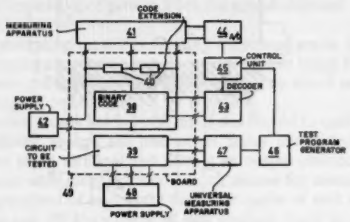
4,074,189
CARRIER WITH CODE

Arie Anthonie Harms, and Johan Gerrit Wark, both of Rijswijk, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 315,304, Dec. 14, 1972, abandoned, which is a continuation of Ser. No. 128,091, March 25, 1971, abandoned. This application July 10, 1974, Ser. No. 487,019

Int. Cl.[2] G01R *15/12*

U.S. Cl. 324—73 R **2 Claims**



1. In a system for the treatment of electronic devices or elements wherein a particular treatment program is selectable upon the occurrence of a particular coded address, said system including at least one carrier of the type such as a printed circuit board, the improvement comprising:

a pair of input terminals located on said carrier; a plurality of galvanic contacts being disposed on said carrier; means for connecting a first of said terminals to a predetermined number of said galvanic contacts; means for connecting the second terminal to a predetermined number of galvanic contacts which are not connected to said first terminal, each of said terminals being identified with a digital logical value, one of said terminals being associated with a logical "1" and the other terminal being associated with a logical "0", said arrangement of galvanic contacts being ordered in accordance with a predetermined pattern so that a predetermined digital coded number corresponds to said ordered arrangement of galvanic contacts; a further galvanic contact being disposed on said carrier;

an electrical impedance element being connected between said further galvanic contact and one of said input terminals, said impedance element forming an analog code element for extending said binary coded arrangement of galvanic contacts, sensing means responsive to said digital coded arrangement of galvanic contacts and said analog code element for providing an address for selecting a corresponding treatment program of said treatment system.

4,074,190
SIGNAL MEASURING APPARATUS

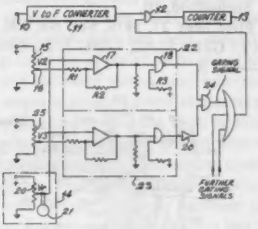
Walter Bunting, Little Chalfont, England, assignor to National Research Development Corporation, London, England

Filed Feb. 5, 1976, Ser. No. 655,376

Int. Cl.[2] G01R *23/16*

U.S. Cl. 324—77 A **3 Claims**

1. Signal measuring apparatus for measuring selected pairs of a time varying signal comprising measuring means for measuring the integral with respect to time of parts of a time varying signal gated to said measuring means, a ramp voltage generator, a plurality of pairs of generators of dc voltages of adjustable magnitudes, a comparator circuit associated with each dc voltage generator for providing a switching signal when the output of the ramp generator is equal to the value of the voltage provided by its associated dc voltage generator, gating means for gating a signal to be measured to said measuring means when a switching signal is provided from one of the dc voltage generators to a pair and for blocking such signal when



a switching signal is provided from the other dc voltage generator of a pair.

4,074,191
FREQUENCY MEASURING DEVICE FOR TELECOMMUNICATION SYSTEMS

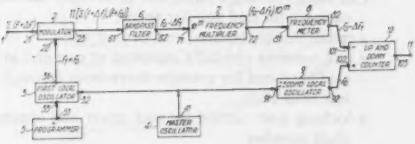
Jacques M. Jules, 1, Allee de Bellevue, Maintenon, France (28130)

Filed Dec. 30, 1976, Ser. No. 755,945

Claims priority, application France, Dec. 30, 1975, 75 40113

Int. Cl.[2] G01R *23/14*

U.S. Cl. 324—79 R **4 Claims**



1. A device for measuring a positive or negative difference Δf between the actual value $(f+\Delta f)$ and the nominal value f of at least one frequency carried by way of a telecommunication line, comprising:

a first local oscillator controlled by a master oscillator and producing a frequency value $(f+f_o)$, f_o being a constant predetermined frequency value which may be added to or subtracted from the frequency f;

a balanced modulator, one input of which is connected to the said line and the other input of which is connected to the output of the first local oscillator, the said modulator then producing, among its modulation products, the frequency term:

$$(f+f_o)-(f+\Delta f)=f_o-\Delta f;$$

a bandpass filter connected to the output of the modulator, the band limits of the said bandpass filter being determined so that the said filter transmits only the said term $(f_o-\Delta f)$;

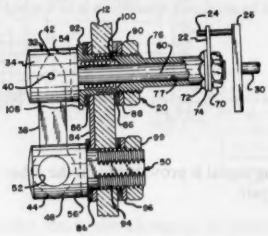
a second local oscillator controlled by the said master oscillator and producing a frequency of value f_o and

means for measuring the algebraic difference between the frequency produced by the said second local oscillator and the frequency transmitted by the filter, the said difference being equal to the value of the difference Δf.

4,074,192
KEYLESS UNIDIRECTIONAL RESET FOR CUMULATIVE DEMAND REGISTER

David Gerald Hart, Clemson, S.C., assignor to Sangamo Electric Company, Springfield, Ill.

Filed May 27, 1976, Ser. No. 690,726
Int. Cl.[2] G01R *11/02;* G05G *5/16;* G06C *15/42*
U.S. Cl. 324—103 R 5 Claims



1. A reset mechanism mountable in and through an aperture in the cover of an electric watt hour meter, said meter having a crank-operated cumulative demand register comprising:

an elongated, tubular bushing member;

a shaft member having a head end and a shank member extending through and rotatably supported by said bushing member;

said bushing member having a radial flange and an intermediate shank portion extendable through said aperture in said cover;

means engageable with said shank portion of said bushing member and the inside of said cover to secure said bushing member within said aperture with said flange member against the outside of said cover member;

said bushing member having a counterbore defining an annular space extending from its flanged end and encompassing a portion of said shank member of said shaft;

said flange having a radial slot in its outer surface communicating with said annular space;

a radial slot in the head end of said shaft;

a link member pivotally mounted at one end in said slot of said head end for rotation thereabout through an angle of less than 180°;

a locking post carried by said cover and spaced from said shaft member;

a radial slot in the locking post oriented to be in the plane of the radial slot of said head member in one position thereof and adapted to receive the other end of said link member in a locked position;

a coil spring around the portion of said shank member of said shaft having its convolutions within said annular space with a bight end of said coil spring extending into said radial slot in said flange member;

said convolutions of said spring being in bearing contact with said shank member within said annular space whereby said shaft member is rotatable in an angular direction opening said convolutions about said shank member and is prevented from rotation in the opposite direction;

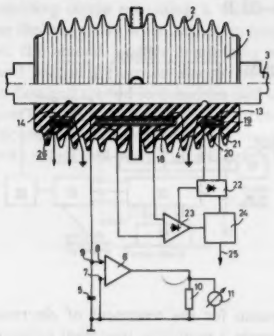
resilient means at the extended end of said shank member retaining said head end in axially thrust relationship with said flange of said bushing member and retaining the bight end of said coil spring in said radial slot; and

an operating lever on the inner end of said shank member for operable engagement with said crank-operated cumulative demand register whereby in the unlocked position said link member is pivotable from the slot of said locking post to an angular position with the axis of said shaft member to serve as a lever to rotate said shaft and said operating lever in said angular direction to a point of re-registry with said slot in said locking post.

4,074,193
COMBINED CURRENT AND VOLTAGE MEASURING APPARATUS

Werner Kohler, Bentfeld, Holstein, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 14, 1974, Ser. No. 523,851
Claims priority, application Germany, Dec. 20, 1973, 2363933
Int. Cl.[2] G01R *1/20, 19/00*
U.S. Cl. 324—126 7 Claims

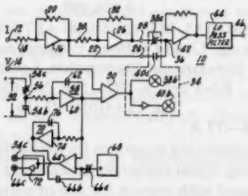


1. A combined current and voltage measuring apparatus for measuring voltage and current on a rod-like primary conductor for conducting current at an upper potential comprising: a capacitive voltage divider having upper and lower potential capacitors and extending between the upper potential and a lower potential; a body of cast resin disposed in surrounding relation to the primary conductor; a cylindrical electrode embedded in said body so as to cause the primary conductor to extend through said electrode in spaced relation to the same, said electrode and the primary conductor conjointly defining said upper potential capacitor of said voltage divider and the portion of cast resin of said body between said electrode and the primary conductor constituting the dielectric of said upper potential capacitor; and, a coreless winding carried by said body of cast resin for sensing the current in the primary conductor, said winding being arranged in surrounding relation to said cylindrical electrode so as to cause said cylindrical electrode to equalize the potential stress on said cast resin body between the primary conductor and said coreless winding.

4,074,194
WATT METER PROVIDING ELECTRICAL SIGNAL PROPORTIONAL TO POWER

Alan W. Wilkerson, 410 Madero, Thiensville, Wis. 53092

Filed Feb. 28, 1977, Ser. No. 773,070
Int. Cl.[2] G01R *7/00*
U.S. Cl. 324—142 10 Claims



1. A watt meter circuit for receiving input signals proportional to the voltage across, and the current through, an electrical element at input terminals and for providing an electrical signal indicative of power at an output terminal, said circuit comprising:

signal forming means coupled to a first of said input termi-

nals for receiving the input signal applied thereto and for providing a pair of signals corresponding to the input signal, said signals being equal to each other in magnitude but opposite to each other in polarity;

switch means having make-break elements actuatable by a signal responsive operator means and receiving said pair of signals for alternately providing said signals to a signal terminal to form a signal wave having portions of alternating opposite polarity in a variable duty cycle;

means connected to said switch means and to the output terminal of said watt meter for providing the electrical signal indicative of power from the signal obtained at said signal terminal;

signal generating means generating a cyclical wave, having half cycles alternating in polarity, said wave being formed of linear partial wave portions and having equal positive and negative peaks; and

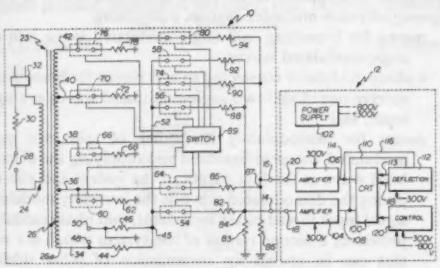
comparator means having one input connected to said signal generating means and the other input connected to a second input terminal and having an output connected to said operator means of said switch means for controlling the operation of said make-break elements of said switch means and the duty cycle of said cyclical wave in accordance with the relative magnitude of said input signal and said cyclical wave.

4,074,195

SEMICONDUCTOR TESTER

Bill Hunt, 6408-139th SE, Snohomish, Wash. 98290

Filed Feb. 16, 1977, Ser. No. 769,110
Int. Cl.[2] G01R *31/22*
U.S. Cl. 324—158 D **15 Claims**



1. An improved semiconductor junction tester, comprising:

a. visual indicator means having two input connections;

b. signal generating means having first, second and third output lines, and producing a first known AC voltage between said first and second output lines, and producing a second known AC voltage between said first and third output lines, at least the AC voltage provided between said first and second output lines being variable;

c. first impedance means connected between the first output line of said signal generating means and ground;

d. means adapted to be connected across a junction to be tested, said adapted means in turn being connected to the tester in such a manner that said junction is in parallel electrically with said first impedance means and such that, in tester operation, an AC test signal is provided across said junction;

e. second impedance means connectable between the second output line of said signal generating means and ground, such that said second impedance means, when so connected, is in parallel electrically with said first impedance means;

f. third impedance means connectable between the third output line of said signal generating means and ground, such that said third impedance means, when so connected, is in parallel electrically with said first impedance means; and

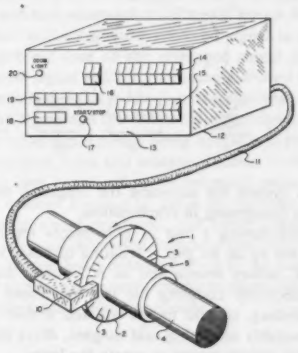
g. means for selectively connecting and disconnecting said third impedance means to the third output line of said signal generating means, wherein, in operation of the tester, a first output signal is developed between said first impedance means and ground for application to one input connection of said indicator means and a second signal output is developed between said second impedance means and ground for application to the other input connection of said indicator means, and wherein said signal generating means is so configured and arranged, and has such an impedance between its first, second and third output lines, and wherein said second and third impedances have such values that (1) in a first operating condition of the tester, wherein said third impedance means is connected, and the AC voltage between the first and second output lines is at a level which is less than the AC voltage between the first and third output lines, an impedance is presented to said junction which is substantially lower than the effective impedance of the circuit in which said junction is connected, and (2) in a second operating condition of the tester, wherein said third impedance means is disconnected, the amplitude of the voltage between the first and second output lines may be increased to a level sufficient to fire said junction and sufficient impedance is presented to said junction to limit the current therethrough to a safe level, whereby a pattern is produced on said visual indicator means which is indicative of the forward and reverse characteristics of said junction.

4,074,196

SPEEDOMETER AND ODOMETER APPARATUS

Douglas G. Webster, 14450 Black Walnut Court, Saratoga, Calif. 95070

Filed Aug. 2, 1976, Ser. No. 710,566
Int. Cl.[2] G01P *3/48*
U.S. Cl. 324—166 **21 Claims**



1. A speedometer and odometer apparatus comprising:

means for generating pulses as a function of the distance a vehicle is moved;

means for calibrating the number of pulses generated by the pulse-generating means, said calibrating means comprising counter means coupled to the pulse-generating means for counting pulses received from the pulse-generating means;

circuit means including switch means for setting a calibrating number in the apparatus;

comparing means coupled to said counter means and said circuit means for comparing the contents of said counter means and said calibrating number, and generating a control signal when a predetermined relationship exists between said counter contents and said calibrating number;

gate means forming an output of said calibrating means coupled to said pulse-generating means for gating therethrough pulses received from said pulse-generating means to said output of said calibrating means; and

means responsive to the control signal generated by said comparing means when said predetermined relationship exists for inhibiting said gate means during the time of receipt of a predetermined number of said pulses from said pulse-generating means so that less than the total number of pulses generated by said pulse-generating means is gated through said gate means for providing said calibrating of the number of pulses received from said pulse-generating means; and

means coupled to the output of said calibrating means for indicating said distance.

4,074,197

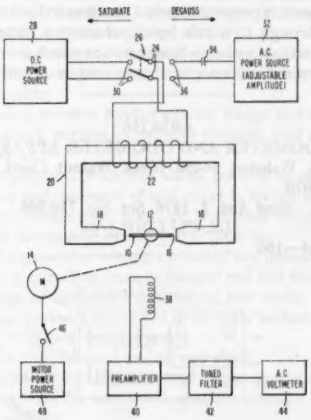
SYSTEM FOR ROTATING SMALL PERMANENT MAGNETS WHILE ADJUSTING AND SIMULTANEOUSLY SENSING THE MAGNETIC MOMENTS THEREOF

Clifford John Bader, West Chester, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Aug. 25, 1976, Ser. No. 717,648

Int. Cl.² G01R *33/12*

U.S. Cl. 324—205 **9 Claims**



1. A system for adjusting the magnetic moment of a bar magnet comprising in combination:

a yoke having a pair of pole pieces separated from each other by an air gap, a winding disposed on said yoke;

a DC power source and an AC power source, means for selectively coupling the last mentioned sources to said winding, spindle means situated within said air gap for rotatably mounting said magnet, drive means coupled to said spindle means to rotate the latter;

the energization of said winding by said DC power source generating a saturating magnetic field in said air gap, said magnet being initially stationary with its extremities aligned with said field and being driven to a saturated state;

the removal of said saturating magnetic field and the subsequent energization of said winding by said AC power source generating a degaussing field of increasing strength in said air gap, said magnet being rotated in a plane parallel to said degaussing field by said drive means and having its moment reduced from said saturated state to a desired level;

a pickup coil positioned in proximity to said rotating magnet and having its axis oriented orthogonally to said degaussing field, the rotation of said magnet causing a voltage to be induced in said coil which is proportional to the magnet flux and to its moment, the flux change resulting in said induced voltage occurring substantially during the rotational interval when said magnet is least influenced by said degaussing field;

amplifier means coupled to said coil, filter means coupled to the output of said amplifier means, and means coupled to the output of said filter means for indicating the amplitude thereof simultaneously with said increasing degaussing field strength, said amplitude being proportional to the magnet moment.

4,074,198

SYSTEM FOR SUPPRESSING SIDEBAND COMPONENTS OF ANGLE-MODULATED WAVE

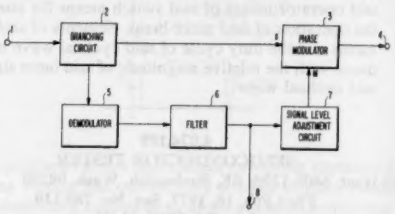
Tadashi Furuya, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed May 13, 1976, Ser. No. 686,202

Claims priority, application Japan, May 16, 1975, 50-58045

Int. Cl.² H04B *1/60*

U.S. Cl. 325—3 **3 Claims**



1. A system for suppressing a predetermined part of the sideband components of an angle-modulated wave in a frequency-division multiplex system, comprising:

means for branching said angle-modulated wave into two angle-modulated waves,

a phase modulator connected to said means for branching to receive one of said two angle-modulated waves as a signal input, and

means for demodulating the other of said two angle-modulated waves to baseband and supplying the demodulated wave as the first output of the system and also supplying the demodulated wave as the inversely modulating signal input to said phase modulator, said phase modulator providing a second output of the system which is a wave that can be reused for transmission of other sideband components.

4,074,199

VESTIGIAL-SIDEBAND TRANSMISSION SYSTEM FOR SYNCHRONOUS DATA SIGNALS

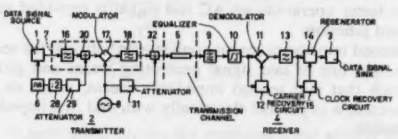
Frank de Jager, Eindhoven, Netherlands, and Juan Jose Martony, Montevideo, Uruguay, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 613,184, Sept. 15, 1975, abandoned. This application Nov. 16, 1976, Ser. No. 742,341

Claims priority, application Netherlands, Sept. 16, 1974, 7412226

Int. Cl.² H04B *1/68*

U.S. Cl. 325—50 **9 Claims**



1. Vestigial-sideband transmission system for transmission of synchronous data signals from a transmitter to a receiver via a transmission channel of restricted bandwidth, comprising

a transmitter including a data signal source, a clock signal

source connected to said data signal source for synchronizing said data signal source, a carrier source, and a filtering and modulating circuit connected to the data signal source and to the carrier source for generating a vestigial-sideband amplitude-modulated channel signal comprising

a shift register having an input connected to the output of said data signal source, and an output;

a frequency multiplier connected to the output of said clock signal source for determining the shift frequency of said shift register;

a weighting circuit having an input connected to said output of said shift register, and an output for producing a baseband signal with a predetermined frequency spectrum; and

filtering and modulating means connected to said output of said weighting circuit for producing a modulated signal.

4,074,200

CIRCUIT ARRANGEMENT FOR SELECTIVE FREQUENCY ANALYSIS OF THE AMPLITUDES OF ONE OR MORE SIGNALS

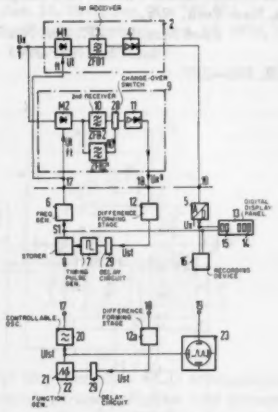
Karl Buchta, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Nov. 15, 1976, Ser. No. 741,849

Claims priority, application Germany, Dec. 10, 1975, 2555602

Int. Cl.[2] H04B *1/36*

U.S. Cl. 325—335 **9 Claims**



1. A circuit arrangement for frequency-selective analysis of the amplitudes of one or more signals in which a first selective receiver automatically scans through a given frequency band, and the scanning speed of its frequency settings is controlled by means of a control signal value which is dependent upon the amplitude difference of signal voltages received consecutively in time, comprising a second selective receiver which has its frequency setting changed in synchronism with the first receiver and with a constant frequency spacing maintained between the instantaneous tuning frequencies of said first and second receivers and the tuning frequency of said second receiver leading the tuning frequency of said first receiver and an analysis device receiving the output of said second receiver for determining the amplitude difference of signal voltages received consecutively in time and deriving the said control signal value and supplying it to said first and second receivers.

4,074,201

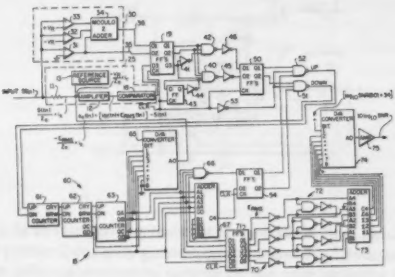
SIGNAL ANALYZER WITH NOISE ESTIMATION AND SIGNAL TO NOISE READOUT

Thomas J. Lennon, Burlington, Mass., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed July 26, 1976, Ser. No. 708,369

Int. Cl.[2] H04B *17/00*

U.S. Cl. 325—363 **15 Claims**



1. Signal analyzing apparatus for producing an estimated noise signal which is an average of differences between a received signal corrupted by additive noise and a reference signal which is equal to the received signal without additive noise, said apparatus including in combination

an input connection for receiving a received signal corrupted by additive noise,

reference signal means for producing a fixed reference signal equal to the received signal without additive noise;

estimated noise signal means for accumulating data and for producing an estimated noise signal determined by the accumulated data contained therein, and

analyzing means coupled to said input connection, said signal means, and said estimated noise signal means for producing a first indication if the received signal is greater than the algebraic sum of the reference signal and the estimated noise signal and for producing a second indication if the received signal is less than the algebraic sum of the reference signal and the estimated noise signal;

said estimated noise signal means being operable in response to a first indication from said analyzing means to alter the accumulated data contained in the estimated noise signal means in a manner tending to cause an increase in the estimated noise signal produced, and being operable in response to a second indication from said analyzing means to alter the accumulated data contained in the estimated noise signal means in a manner tending to cause a decrease in the estimated noise signal produced.

4,074,202

BIASING CIRCUIT FOR THYRATRON

Graham John Scoles, Chelmsford, England, assignor to English Electric Valve Co., Ltd., Essex, England

Filed Oct. 26, 1976, Ser. No. 735,540

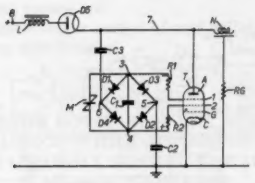
Claims priority, application United Kingdom, Oct. 28, 1975, 44515/75

Int. Cl.[2] H01J *17/44*

U.S. Cl. 328—258 **17 Claims**

1. A multi-gap thyratron arrangement comprising a thyratron having at least one gradient-grid pair consisting of two

adjacent electrodes between the cathode and anode of said thyratron and means for constantly biassing that electrode of



said gradient-grid pair which is nearer the anode negatively with respect to the other electrode of said gradient-grid pair.

4,074,203

ELLIPTICAL BEAM AMPLIFYING SYSTEM

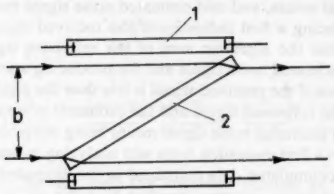
John Leonard Hughes, 34 Nungara Place, Aranda, A.C.I., Australia (2614)

Filed May 14, 1976, Ser. No. 686,542

Claims priority, application Australia, May 15, 1975, 1609/75

Int. Cl.[2] H01S *3/00*

U.S. Cl. 330—4.3 **8 Claims**



1. A laser amplifier system for amplifying laser beams of elliptical cross-section comprising one or more amplifying disc segments of circular cross-section whose effective diameter is much greater than its thickness and equal to the major axis of the laser beam cross-section, the said segment of circular cross-section being orientated at an angle to the minor axis of the elliptical beam cross-section given by the cosecant of the ratio of minor to major axes of the elliptical beam cross-section and symmetric about the axis of propogation of the laser beam.

4,074,204

EQUALIZING AMPLIFIER

Gregory W. Broburg, White Bear Lake, and Allen C. Clark, Minneapolis, both of Minn., assignors to Van Alstine Audio Systems, Inc., Burnsville, Minn.

Filed Nov. 22, 1976, Ser. No. 743,977

Int. Cl.[2] H03F *1/36*

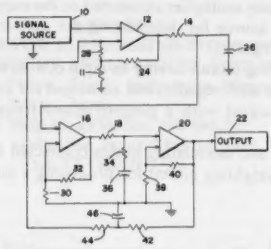
U.S. Cl. 330—109 **7 Claims**

1. A frequency contouring amplifier comprising:

a first amplifying means having an input connected to receive the signal and having an output, said first amplifying means increasing the entire spectrum of the signal;

a first passive filter network connected to the output of said first amplifying means so as to attenuate the portion of the signal above 2122 Hertz;

a second amplifying means having an input connected to the output of said amplifying means and having an output, said second amplifying means increasing the entire spectrum of the signal received from said first amplifying means as attenuated by said first filter network;



a second passive filter network connected to the output of said second amplifying means so as to attenuate the portion of the signal from 50 to 500 Hertz; and

at least one third amplifying means connected to the output of the second amplifying means to produce a low impedance frequency contoured output signal, said third amplifying means increasing the entire spectrum of the signal received from said second amplifying means as attenuated by said second passive filter network.

4,074,205

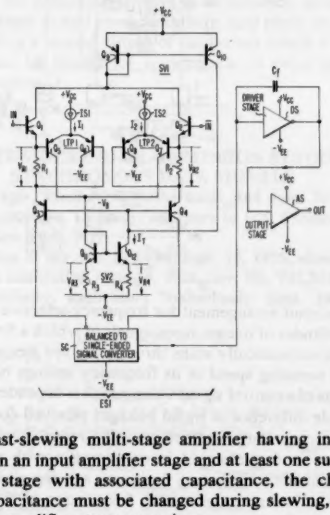
INPUT STAGE FOR FAST-SLEWING AMPLIFIER

Thomas Joseph Robe, Union, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 9, 1977, Ser. No. 775,863

Int. Cl.[2] H03F *3/45*

U.S. Cl. 330—257 **21 Claims**



1. A fast-slewing multi-stage amplifier having in cascade connection an input amplifier stage and at least one succeeding amplifier stage with associated capacitance, the charge on which capacitance must be changed during slewing, wherein said input amplifier stage comprises:

first and second transistors of a first conductivity type, each having a base electrode and each having emitter and collector electrodes and a principal conduction path therebetween;

means for applying first and second input potentials to the

emitter electrode of said first transistor and to the emitter electrode of said second transistor, respectively, said input potentials having respective quiescent levels;

means for applying collector potentials to said first and said second transistors for conditioning them to operate in the normal transistor mode, including means for applying the collector current variations of said first transistor to the amplifier stage in said cascade connection immediately succeeding said input amplifier stage;

means for applying quiescent base potentials to said first and second transistors that differ respectively from the quiescent levels of the input potentials applied to their respective emitter electrodes so as to cause quiescent conduction of said first and second transistors;

a first resistor connected to sense the flow of current through the principal conduction path of said first transistor for developing a potential drop across said first resistor proportional to the current it senses, which potential drop has a quiescent value dependent upon the level of quiescent conduction of said first transistor; and

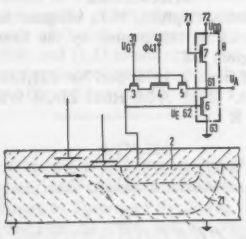
first slew-rate improvement means, responsive to decrease in the potential drop across said first resistor from its quiescent value, for increasing the difference between the potential applied to the base electrode of said second transistor and the quiescent level of the input potential applied to the emitter electrode of said second transistor, thereby to increase the flow of current through the principal conduction path of said second transistor.

4,074,206

LINEAR OUTPUT AMPLIFIER FOR CHARGE-COUPLED DEVICES

Karlheinrich Horninger, Eglharting, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 14, 1977, Ser. No. 759,352
Claims priority, application Germany, Jan. 23, 1976, 2602520
Int. Cl.[2] H03F *3/16*
U.S. Cl. 330—269 **4 Claims**



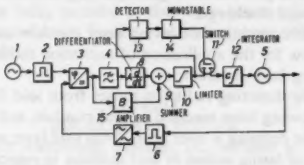
1. A linear output amplifier for a CCD arrangement comprising an FET switching transistor and a load element, connected in series to one another, the connection point being the output terminal of said amplifier, the gate terminal of said switching transistor being the input of the amplifier, said input of said amplifier being connected to said CCD arrangement, and between the output and the input of said amplifier is provided a second FET, by which the input to said amplifier can be electrically connected to the output of said amplifier, said load element being a third field effect transistor whose load resistance can be varied by connecting a voltage to the gate terminal thereof, wherein in order to prevent input-couplings of control pulses of said second transistor, a fourth FET is connected between said second transistor and said input of said amplifier, a fifth FET is connected between the said second transistor and said input of said amplifier, and the gate terminals of said second and fifth transistors being connected to a voltage source.

4,074,207

INTERFERENCE RESISTANT PHASE-LOCKED LOOP

Gunnar Stefan Forsberg, Stockholm, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Dec. 13, 1976, Ser. No. 749,875
Claims priority, application Sweden, Dec. 30, 1975, 7514797
Int. Cl.[2] H03B *3/04*
U.S. Cl. 331—1 A **5 Claims**



1. In an interference resistant phase-locked loop, particularly for carrier frequency generation in Frequency Division Multiplex telecommunication systems of the type having a voltage controlled oscillator provided with a control input and a signal output, a phase discriminator with two inputs and one output to which inputs are fed a reference signal and a feedback signal respectively, the feedback signal being derived from the output signal of the oscillator, and a low pass filter for filtering of the phase difference representing output signal from said discriminator, the improvement comprising a transmission path arranged to connect the output of the low pass filter with the control input of the oscillator, said transmission path comprising a series connection of

a differentiating circuit for the differentiation of the output signal from the low pass filter, a limiter which limits the output signal from the differentiating circuit at two levels symmetrically arranged on both sides of a zero level, and

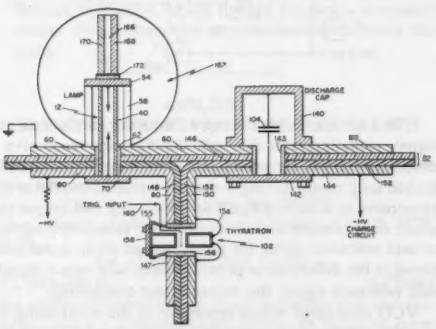
an integrating circuit having an output which produces a control voltage for said oscillator.

4,074,208

STABILIZED REPETITIVELY PULSED FLASHLAMPS

Michael E. Mack, Manchester, and Donna B. C. Northam, Malden, both of Mass., assignors to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed Sept. 17, 1975, Ser. No. 614,223
Int. Cl.[2] H01S *3/092*
U.S. Cl. 331—94.5 P **13 Claims**



1. A stabilized pulse operated flashlamp laser comprising:

first and second electrodes;

an enclosure for said first and second electrodes and containing an atmosphere of a predetermined gas;

means for flowing said gas through said enclosure;

means for imparting a motion to said gas in flowing through

said enclosure which comprises a circulation around an axis between said first and second electrodes;

means for initiating breakdown of the gas between said electrodes;

means for maintaining breakdown of the gas between said first and second electrodes as a stabilized continuous discharge;

means for repetitively augmenting the current of said discharge to provide an augmented output of radiant energy from said discharge;

a conduit containing a flowing laser medium and having a window for the application of excitation radiation to said flowing laser medium;

means for directing radiation pulses from said flashlamp to the flowing laser medium in said conduit; and

means for defining a laser beam from said laser medium as a result of lasing action of said medium in response to each pulse of excitation radiation from the discharge between said first and second electrodes;

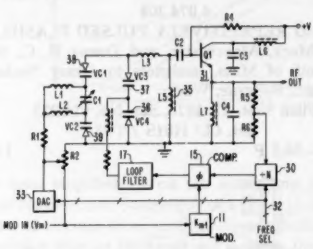
the continuous discharge between said first and second electrodes producing insufficient energy to generate lasing of said laser medium whereas the level of radiant energy from said flashlamp during each pulse of discharge is sufficient to provide substantial lasing of said medium.

4,074,209

WIDE RANGE FREQUENCY MODULATION OF NARROW LOOP BANDWIDTH PHASE-LOCKED OSCILLATORS

Morris Lysobey, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 13, 1976, Ser. No. 749,981
Int. Cl.² H03C *3/22*
U.S. Cl. 332—19 **3 Claims**



1. In a circuit for producing a frequency-modulated output signal, including reference modulator means responsive to a modulating signal for producing a reference signal and phase-locked loop means having voltage-controlled-oscillator means responsive to a control signal for producing said output signal, phase discriminator means responsive to said output signal and to said reference signal for producing an error signal proportional to the difference in phase between said output signal and said reference signal, the improvement comprising:

VCO modulator means reponsive to the modulating signal for producing a correction signal, the VCO modulator means including means for amplifying said modulating signal by a factor proportional to the ratio of the sensitivity of said reference modulator means to the sensitivity of said voltage-controlled-oscillator; and

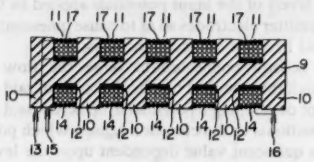
combining means responsive to the error signal and said correction signal for supplying said control signal to said voltage-controlled-oscillator means.

4,074,210

DISTRIBUTION TYPE DELAY LINE

Hiroshi Otake, Katano; Saburo Koresawa, Hirakata, and Kozo Hashimoto, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Aug. 4, 1976, Ser. No. 711,648
Claims priority, application Japan, Aug. 20, 1975, 50-101376; Aug. 20, 1975, 50-101377; Aug. 20, 1975, 50-101378; Aug. 20, 1975, 50-101387
Int. Cl.² H03H *7/30, 7/34;* H01F *5/02, 5/14*
U.S. Cl. 333—29 **4 Claims**



1. A distributed type delay line comprising

a bobbin made of insulating material and provided with a plurality of coaxial longitudinally spaced flanges defining a plurality of transverse slots therebetween,

a signal winding in each slot of said insulated bobbin, said signal windings being series-connected,

a grounding electrode winding wound between the core of said bobbin and each of said signal windings, and

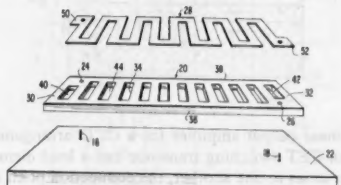
a shielding winding wound on each of said signal windings, each of said grounding electrode and shielding windings being wound so as to cancel the flux developed by the other winding and only one end of each of said grounding electrode and shielding windings being connected to grounding terminal, to reduce the series inductance between said grounding terminal and said grounding and shielding windings.

4,074,211

DIELECTRIC SUBSTRATE FOR SLOW-WAVE STRUCTURE

Calvin Dwight Bates, Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 7, 1976, Ser. No. 721,136
Int. Cl.² H01P *3/08;* H01J *23/24, 9/00*
U.S. Cl. 333—31 R **10 Claims**



1. In a meander line slow-wave circuit device consisting of a planar assembly including a conductive ground plane, a dielectric substrate contiguous with said ground plane and a serpentine meander line conductor having connecting transverse and longitudual segments disposed on a portion of the upper surface of said substrate, the improvement comprising:

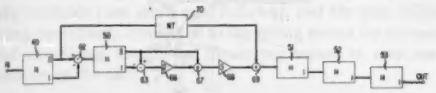
an integral unitary ladder shaped planar dielectric substrate having a plurality of spaced transverse vane segments intersecting a pair of opposing continuous longitudinal vane segments, portions of said longitudinal vane segments between transverse vane segments being exposed when said meander line conductor is disposed thereon, and including a plurality of slot-like openings in the dielectric substrate between adjacent transverse segments of

said conductor disposed on said transverse vane segments, the complete lower surface of said intersecting longitudinal and transverse vane segments of said substrate being in continuous direct contact with said ground plane.

4,074,212
MULTISECTION FILTER USING INFLECTED AMPLITUDE CHANGE FUNCTION TO SHARPEN ITS BAND-EDGE RESPONSES

Richard Wesley Hamming, Monterey, Calif., and James Frederick Kaiser, Summit, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 16, 1976, Ser. No. 751,125
Int. Cl.² H03H 7/10
U.S. Cl. 333—70 T **17 Claims**



1. In combination,

a plurality of filter sections of predetermined frequency response characteristics,

means for connecting said sections in a tandem signal path to sharpen the transitional portion of said characteristics between each stopband and any adjacent passband thereof, and

said connecting means includes means for interconnecting said sections so that a plot of the amplitude change function of overall tandem transfer function amplitude versus the transfer function amplitude of one section of the combined sections is described by

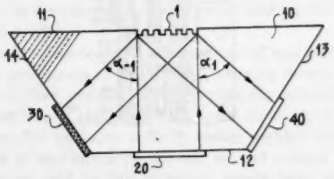
$$H_T = H_S^{n+1}(f) \sum_{k=0}^{M} \frac{(n+k)!}{n!\,k!} [1 - H_S]^k$$

where H_T is the transfer function amplitude as a function of frequency of said interconnected sections, H_S is the transfer function amplitude as a function of frequency of one of said sections, n and m are the orders of tangency of the polynomial plot at ordinates of 0 and 1, respectively, the plot passing through the (0,0) and (1,1) coordinates, and the set n and m having positive integer set values other than the sets ($n=0$, $m=1$), (n 1, $m=0$), and ($n=m=0$).

4,074,213
ELASTIC BULK WAVE FREQUENCY FILTER

Bernard Epsztein, and Gérard Kantorowicz, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 30, 1976, Ser. No. 746,127
Claims priority, application France, Dec. 5, 1975, 75 37317
Int. Cl.² H03H 9/26, 9/30, 9/32; H01L 41/04
U.S. Cl. 333—71 **9 Claims**

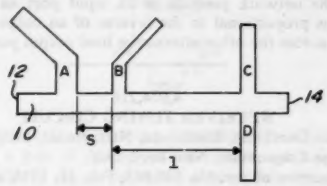


1. A frequency filter for filtering a signal having a plurality of frequency components, comprising an elastic body having two parallel surfaces, the first of said surfaces bearing an input transducer to which said signal to be filtered is applied, said input transducer accordingly, in said body, generating a beam of elastic bulk waves corresponding to said signal, the second of said surfaces bearing a grating of parallel obstacles with diffracts said components of said beam in a plurality of diffracted beams, each having a direction which is governed by the frequency of said components, said obstacles having a shape and being arranged in such a way as to concentrate substantially all the energy in said diffracted beams, said body having a third surface which is inclined relative to said two parallel surfaces, an output transducer being applied on said third surface for intercepting one of said diffracted beams, said third surface being parallel to the wave planes of said intercepted diffracted beam for the central frequency of said signal to be filtered.

4,074,214
MICROWAVE FILTER

Ronald Albert Aichholzer, Chicago, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sept. 20, 1976, Ser. No. 724,501
Int. Cl.² H01P 1/20, 7/00; H04B 1/26; H01P 3/08
U.S. Cl. 333—73 S **10 Claims**



1. A transmission line filter for passing signals having frequencies within a passband centered about a first predetermined frequency and attenuating signals having frequencies within a stopband centered about a second predetermined frequency, the filter comprising:

a central transmission line having an input terminal and an output terminal for receiving signals at its input terminal and passing the same to said output terminal; and

first, second and third stubs, each stub of predetermined dimension and coupled to the transmission line at a predetermined location such that

a. the first and second stubs resonate with the third stub at the first predetermined frequency,

b. at least one of the first and third stubs attenuates transmission line signals having frequencies within the stopband, and

c. the third stub attenuates transmission line signals at a flyback frequency, which flyback frequency is created within the stopband by an interreaction between the stubs.

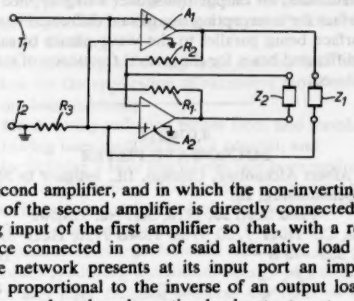
4,074,215
STABLE GYRATOR NETWORK FOR SIMULARITY INDUCTANCE

John Mortimer Rollett, London, England, assignor to Post Office, London, England

Filed Oct. 5, 1976, Ser. No. 729,716
Claims priority, application United Kingdom, Oct. 7, 1975, 40985/75
Int. Cl.² H03H 7/44, 11/00
U.S. Cl. 333—80 R **6 Claims**

1. An electrical impedance network including first and second differential d.c. amplifiers each having an inverting input and a non-inverting input and an output, an input port comprising a first input terminal and a second input terminal, a first alternative load output port and a second alternative load output port, the non-inverting input of the first amplifier being connected directly to the first input terminal and, by way of a first resistive impedance, to the output of the second amplifier, the inverting input of the second amplifier being connected by way of a second resistive impedance to the output of the first

amplifier, the non-inverting input of the second amplifier being connected by way of a third resistive impedance to the second input terminal, the first alternative load output port being formed between the non-inverting input of the second amplifier and the output of the first amplifier, and the second alternative load output port being formed between the inverting input terminal of the second output amplifier and the output terminal



of the second amplifier, and in which the non-inverting input terminal of the second amplifier is directly connected to the inverting input of the first amplifier so that, with a resistive impedance connected in one of said alternative load output ports the network presents at its input port an impedance which is proportional to the inverse of an output load connected across the other alternative load output port.

4,074,216

RECEIVER TUNING CIRCUIT

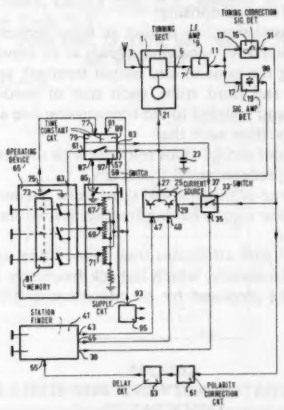
Arnoldus Garskamp, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 549,063, Feb. 11, 1975, abandoned. This application Sept. 24, 1976, Ser. No. 726,267

Claims priority, application Netherlands, Feb. 27, 1974, 7402624

Int. Cl.² H03H 5/12; H03J 3/06, 5/04

U.S. Cl. 334—15 **5 Claims**



1. A receiver tuning circuit comprising a tuning section having a tuning input, a capacitor means coupled to said tuning input for applying a tuning voltage thereto, a controllable current source coupled to said capacitor, a tuning correction signal detector means coupled between said tuning section and said current source for applying an automatic tuning correction signal to said capacitor means through said current source, and means for immediately tuning said tuning section to a selected frequency independently of the previous voltage on said capacitor comprising a first switch coupled to said capacitor and an operating device means for controlling said switch for an operating period, said operating device including a memory means for storing the last adjusted state of said operating device, at least one potentiometer and a generator means for effecting that a signal from said potentiometer is applied to said capacitor through said switch upon operation of said operating device, and said first switch including a first time constant circuit means coupled to said generator for maintaining said switch in an on position for a selected period of time independent of said operating period.

4,074,217

CLEANING UNIT FOR AN OPTICAL SYSTEM IN A COPYING MACHINE

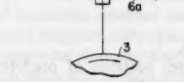
Nobuyuki Yanagawa, Chigasaki, Japan, assignor to Ricoh Company, Ltd., Japan

Filed May 20, 1976, Ser. No. 688,333

Claims priority, application Japan, May 21, 1975, 50-68648[U]

Int. Cl.² G03B 27/52, 27/00

U.S. Cl. 355—30 **8 Claims**



6. In a cleaning unit for an optical system in a copying machine comprising means movable in reciprocal motion along a predetermined path for scanning an original to be copied through said optical system, the improvement comprising

a. a mechanical wiper means arranged to be automatically brought into light pressing contact with at least one face to be cleaned of said optical system when said movable means arrives at a position corresponding to one of the extremities of said path, and

b. means for moving said wiper means relative to and along said face while maintaining the light pressing contact thereon until said wiper means stands aside off said faces when said movable means departs from said position for scanning.

4,074,218

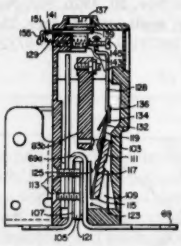
CIRCUIT BREAKER

John G. Salvati, Patterson Township, Beaver County, and Paul Skalka, Beaver, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 7, 1976, Ser. No. 684,140

Int. Cl.² H01H 9/00

U.S. Cl. 335—176 **4 Claims**



1. A circuit breaker responsive to abnormal currents in the conductors of an electrical distribution system and for actuating a circuit interrupter to open upon the occurrence of predetermined operating conditions, comprising a circuit breaker mechanism having separable contacts adapted to be connected as part of the distribution system, the circuit breaker mechanism also comprising a releasable member movable from a

latched position to effect opening of the contacts, a latch lever movable between latched and unlatched positions of the releasable member and being biased in the latched position, a stationary magnetic structure for each conductor of the distribution system and comprising a coil and core assembly and an armature, a trip bar movable to unlatch the latch lever and being biased in the latched position, lever means associated with each stationary magnetic structure for moving the trip bar to the unlatched position, the lever means comprising the armature and being movable in response to abnormal currents in at least one of the conductors, the armature being positioned at a constant distance from said assembly, tension means for varying tension on the lever means and comprising adjustable spring means operatively connected to the lever means so that the force required to attract the armature to said assembly is adjustable without varying the distance between the armature and said assembly, the tension means also comprising a manually rotatable cam and a cam follower, and the cam follower being operatively connected to the spring means for increasing and decreasing tension on the spring means in response to rotation of the cam.

4,074,219

MOUNTING MEANS FOR A CIRCUIT BREAKER

Svein T. Nordberg, and Donald R. Shaner, both of El Paso, Tex., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Mar. 24, 1976, Ser. No. 669,999
Int. Cl.[2] H01H *85/02*
U.S. Cl. 337—186 **10 Claims**

1. Mounting means for mounting a circuit breaker having an envelope with a pair of electrical conductors extending from a base of said envelope in a holder having an electrically insulative body with a conductive first contact carried by the base of said body and a conductive first retaining means carried by said body comprising:

conductive second retaining means circumscribing at least a portion of said envelope and bonded thereto for engaging said first retaining means to retain said circuit breaker in said holder;

means for electrically connecting one of said pair of electrical conductors to said second retaining means;

a conductive second contact electrically connected to the other one of said pair of electrical conductors; and

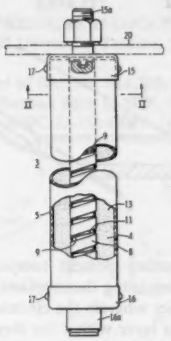
electrically insulative spacing means molded between said base of said envelope and said second contact for fixedly spacing said second retaining means from said second contact a predetermined distance, said spacing means encompassing said pair of conductors for holding said conductors in a spaced relationship, said predetermined distance ensuring contact between said first and second contacts when said first and second retaining means are engaged.

4,074,220

FUSE STRUCTURE HAVING IMPROVED GRANULAR FILLER MATERIAL

James N. Santilli, Bloomington, Ind., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 515,949, Oct. 18, 1974, abandoned. This application Sept. 14, 1976, Ser. No. 723,255
Int. Cl.[2] H01H *85/18*
U.S. Cl. 337—276 **9 Claims**



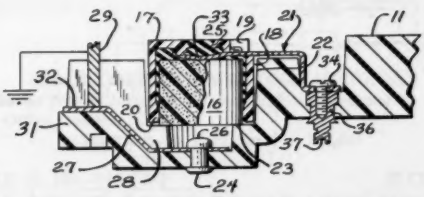
1. A fuse structure comprising, in combination, a fuse holder supporting a pair of spaced fuse terminals and defining an enclosed volume, one or more fuse elements electrically connected to said spaced fuse terminals and passing through said enclosed volume, a granular filling material for said enclosed volume to assist in deionizing the arc established during fusing of the fuse structure, said granular filling material comprising sand and admixed water.

4,074,221

EPOXY BONDED SILICON CARBIDE LIGHTING-PROTECTION VALVE

James W. Milligan, West Lafayette, Ind., assignor to Duncan Electric Company, Inc., Lafayette, Ind.

Filed Sept. 30, 1976, Ser. No. 728,315
Int. Cl.[2] H01C *7/10*
U.S. Cl. 338—21 **2 Claims**



1. A lightning protection valve pressure molded from silicon carbide powder with the particles thereof coated with a resin binder and interstices between the coated particles largely filled with aluminum oxide to prevent internal tracking; the valve including opposed terminal faces and the sides of the valve between the faces being substantially free of tracking characteristics.

4,074,222
PLANAR HEATING ELEMENT

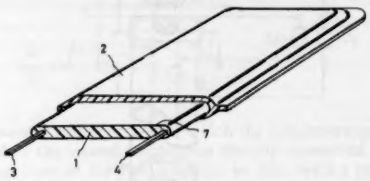
Shin Kiyokawa; Shokichi Sakaguchi, and Toru Takeuchi, all of 139, Kamihikona, Misato, Saitama, Japan

Division of Ser. No. 562,046, March 26, 1975. This application Aug. 1, 1975, Ser. No. 601,178

Claims priority, application Japan, Mar. 29, 1974, 49-35373; Mar. 29, 1974, 49-35374

Int. Cl.[2] H01C *3/06*

U.S. Cl. 338—212 1 Claim



1. A planar heating element comprising a thin flat body formed from an insulating thermoplastic resin and electrically conductive powder wherein the electrically conductive powder is formed in a layer within the thermoplastic resin in the neighborhood of the entire surface of the body and lead wires within said body, said lead wires being positioned near the surface of the body such that the lead wires are electrically connected to said layer of electrically conductive powder; said planar heating element being produced by a method comprising uniformly melt-admixing and insulating thermoplastic resin with an electrically conductive powder wherein said electrically conductive powder is present in an amount less than 40% by weight of the thermoplastic resin, extruding the melted mixture to form said planar heating element, applying wires lengthwise into the extruded body, stretching or drafting the extruded body in the softening state and immediately continuously rapidly cooling the extruded body at a temperature of less than 20° C. whereby said electrically conductive powder is in a higher concentration near the surface of the element.

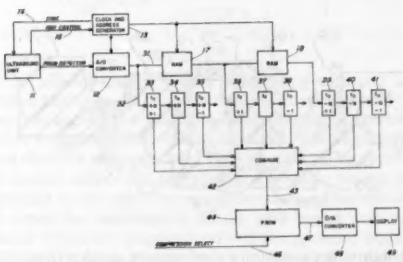
4,074,223
PEAK DETECTOR FOR RESOLUTION ENHANCEMENT OF ULTRASONIC VISUALIZATION SYSTEMS

Reginald C. Eggleton, and Warren L. Williamson, both of Indianapolis, Ind., assignors to Indianapolis Center for Advanced Research, Indianapolis, Ind.

Filed Aug. 3, 1976, Ser. No. 711,359

Int. Cl.[2] G01S *9/66*

U.S. Cl. 340—1 R 11 Claims



1. A peak detector system for ultrasonic visualization arrangements comprising:

a. first means for dividing received ultrasonic energy into resolution elements;

b. second means for creating for each resolution element a plural bit word which encodes the value of the received ultrasonic energy in the resolution element;

c. third means for storing said plural bit words; and

d. fourth means connected to said third means for comparing said plural bit words and producing at its output a signal indicative of peak points determined by said fourth means for comparing.

4,074,224
ACOUSTIC WAVE TRANSDUCER WITH AUTOMATIC COMPENSATION OF THE STATIC PRESSURE VARIATIONS

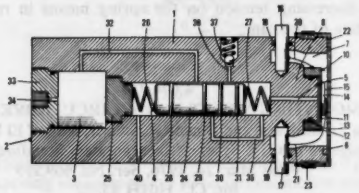
Jean Laurent, Morainvilliers, France, assignor to Institut Francais du Petrole, France

Filed Oct. 18, 1976, Ser. No. 733,052

Claims priority, application France, Oct. 27, 1975, 75 32993

Int. Cl.[2] H04B *13/00*

U.S. Cl. 340—8 PC 14 Claims



1. An acoustic wave transducer drive comprising a sensitive element disposed in a rigid body provided with at least one wall transparent to acoustic waves, the sensitive element having a first face subjected through said transparent wall to the pressure prevailing in an external medium and a second face in front of an inner cavity of said body, automatic regulation means for establishing communication between the inner cavity and the external medium or a source of fluid at a pressure permanently higher than that of the external medium, depending on whether the internal pressure in said cavity is either greater or smaller than the pressure prevailing in the external medium, said regulating means comprising a member movable in said inner cavity and delimiting with the inner surface thereof several compartments respectively communicating, when the pressure difference is lower than a certain threshold value, directly with the external medium, directly with the source of pressurized fluid, with the portion of the cavity in front of the second face of the sensitive element and with the external medium through a valve which may open toward the outside of the rigid body, said compartments being separated from one another.

4,074,225
EMERGENCY DETECTION ALARM AND EVACUATION SYSTEM

Joseph L. Vandeweghe, Englewood, N.J., assignor to Engleway Corporation, Englewood, N.J.

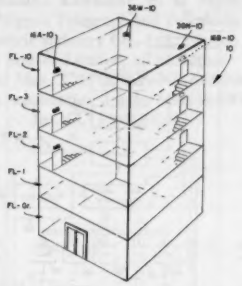
Filed May 9, 1975, Ser. No. 576,034

Int. Cl.[2] G08B *21/00*

U.S. Cl. 340—237 R 7 Claims

1. An emergency detection and evacuation system for a building having a plurality of stories comprising, a plurality of detectors spatially distributed on each of said stories operative to detect an emergency condition; a plurality of emergency signalling units respectively located adjacent emergency exits; and a control panel comprising a plurality of indicators respectively connected to said emergency condition detectors an a plurality of signalling switches respectively connected to said signalling units for selectively actuating and deactuating said signalling units in response to said detectors; said signalling units being respectively operative in response to the actuation of respectively associated switches to emit coded audible sig-

nals with each of said emitted audible signals being uniquely coded to distinguish each of said coded audible signals from all other of said coded audible signals, said detectors operative to respectively actuate the corresponding panel indicators upon



the occurrence of an emergency condition in the vicinity of a detector and means for manually actuating and deactuating selected signalling units in response to the observation by an operator of the actuation and non-actuation of particular panel indicators on said control panel.

4,074,226
BRAKE MALFUNCTION WARNING AND INDICATING SYSTEM FOR AUTOMOBILES

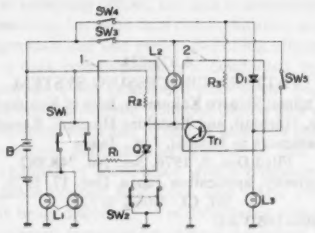
Nobuhiro Takeda; Masaichi Hattori; Minoru Kondo, all of Nagoya, and Tatsuo Kato, Inazawa, all of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Japan

Continuation of Ser. No. 597,995, July 22, 1975, abandoned, which is a continuation of Ser. No. 387,643, Aug. 13, 1973, abandoned. This application Mar. 4, 1976, Ser. No. 663,857

Claims priority, application Japan, Aug. 15, 1972, 47-81132; Aug. 25, 1972, 47-85061; July 25, 1973, 48-87313

Int. Cl.[2] G08B *21/00;* **B60Q** *1/00*

U.S. Cl. 340—52 B **1 Claim**



1. A brake malfunction warning and indicating system for use with a brake system of an automotive vehicle, said brake system having a brake pedal and working fluid under pressure therein, said warning and indicating system comprising a power source, a stop switch connected to said source adapted to close in response to the depression of the brake pedal, a stop lamp connected through said stop switch to the power source, a brake warning switch normally closed when the brake pedal is released, but adapted to open when the brake pedal is depressed and the pressure of the working fluid in the brake system is at a normal level and to remain closed in response to a possible malfunction of the brake system in terms of the working fluid when the brake pedal is depressed, a controlled rectifying element having an anode and cathode connected between said brake warning switch and an anode of said power source, and at its gate to said stop switch, an indicating means connected at one end to the anode of said controlled rectifying element and at the other end through an ignition switch to the anode of said power source, a starter switch connected to said power source, and a switching means turned ON when said starter switch is closed, rendering the indicating means conductive through said ignition switch.

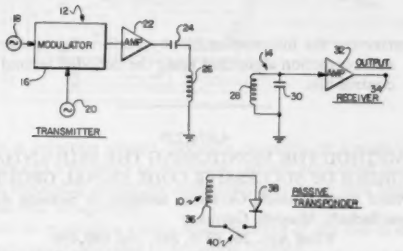
4,074,227
TIRE PRESSURE INDICATOR

Henry P. Kalmus, 3000 University Terrace, NW., Washington, D.C. 20016

Continuation-in-part of Ser. No. 524,285, Nov. 15, 1974, abandoned. This application May 5, 1976, Ser. No. 683,431

Int. Cl.[2] B60C *23/02;* **G08B** *19/00*

U.S. Cl. 340—58 **11 Claims**



1. A system for electro-magnetically monitoring the internal pressure of a tire having a plurality of possible states comprising:

a. pressure sensor means for determining one of the said plurality of states of said tire;

b. transmitter means for transmitting an interrogation signal composed of a carrier wave modulated at a predetermined modulating frequency and means tuned to said carrier frequency to remove all residual energy at the modulating frequency;

c. transponder means, operable in response to said pressure sensor means, for passively detecting said interrogation signal and retransmitting an information signal at said modulating frequency as a function of the state of said sensor, said transponder means comprising a non-linear electrical element series coupled to an inductor;

d. and receiver means comprising a parallel coupled inductor and capacitor tuned only to said modulating frequency for providing an output indicative of the tire pressure.

4,074,228
ERROR CORRECTION OF DIGITAL SIGNALS

Charles Maria Jonscher, London, England, assignor to Post Office, London, England

Filed Oct. 26, 1976, Ser. No. 735,443

Int. Cl.[2] G06F *11/12*

U.S. Cl. 340—146.1 AQ **25 Claims**

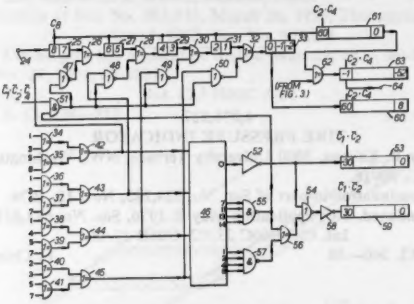
1. A method of correcting errors in a digital signal, the method comprising the steps of:

receiving a digital signal comprising information bits, first error control bits corresponding to a first error control code, and second error control bits corresponding to a second error control code,

decoding the first error control bits to determine the probability of error in the received signal,

decoding the second error control bits,

using the error probability determined from the first error control bits to define a correction algorithm, and



correcting the information bits by performing on them the said correction algorithm using the decoded second error control bits.

4,074,229

METHOD FOR MONITORING THE SEQUENTIAL ORDER OF SUCCESSIVE CODE SIGNAL GROUPS

Gerhard Prey, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 26, 1976, Ser. No. 680,494
Claims priority, application Germany, Apr. 25, 1975, 2518588
Int. Cl.[2] G06F *11/10*; G11C *29/00*
U.S. Cl. 340—146.1 AG **4 Claims**

1. A method for monitoring for insuring the accurate and proper sequential order of successive code signal groups used in program controlled data processing apparatus, wherein each said code signal group includes at least two check characters, at least one of which is derived from the subsequent code signal group and wherein the accurate and proper sequential order is monitored by comparing the said check character with a further check character derived from the next code signal group, comprising the steps of:

deriving both said check characters from the successive code signal group,

monitoring the address sequence under the control of a first of said check characters,

monitoring the sequence of instructions using the second of said check characters and

comparing check characters derived directly from available indications to or from the next code signal group in sequence using separate checking apparatus.

4,074,230

COMMUNICATION METHOD AND APPARATUS FOR PROVIDING AN ENHANCED SIGNAL FROM DIVERSE SIGNALS

Phineas J. Icenbice, Jr., Northridge, Calif., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed May 24, 1976, Ser. No. 689,331
Int. Cl.[2] G06F *11/08*; H04B *7/02*
U.S. Cl. 340—146.1 BE **15 Claims**

1. A method of communicating comprising the steps of:

(a) providing a digital signal to be communicated;

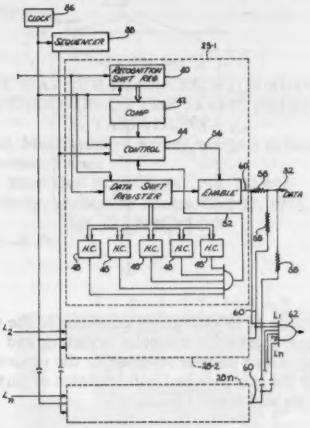
(b) formating the digital signal into a serial digital signal having a plurality of information bits, the digital signal being preceded by a predetermined recognition code, and containing an error detection code, the error detection code having a number of bits which is less than the number of information bits;

(c) modulating and transmitting the digital signal;

(d) receiving and demodulating a plurality of diverse signals each representing the transmitted signal, to provide a plurality of received digital signals;

(e) interrogating the plurality of received digital signals for recognition of the predetermined recognition code;

(f) interrogating the plurality of received information bits in the digital signals in conjunction with their error detection code; and



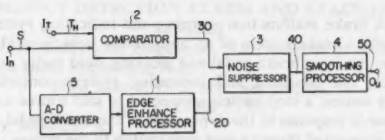
(g) assembling a digital signal by selecting at least one received digital signal for which the recognition code was in fact recognized and which the respective error detection code indicates is accurate.

4,074,231

PATTERN PROCESSING SYSTEM

Shunichi Yajima; Shigeru Kakumoto, both of Kokubunji; Yoshiji Fujimoto, Hachioji, and Toshihiro Hananoi, Kanagawa, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 9, 1976, Ser. No. 748,882
Claims priority, application Japan, Dec. 17, 1975, 50-149624
Int. Cl.[2] G06K *9/12*
U.S. Cl. 340—146.3 AG **5 Claims**



1. A pattern processing system comprising:

first processing means to subject a pattern input signal to a filtering processing of enhancing an edge of a pattern,

binary-coding means to binary-code said pattern input signal by a predetermined threshold value,

noise suppressing means to suppress noises by a nonlinear processing of outputs from said first processing means and said binary-coding means, and

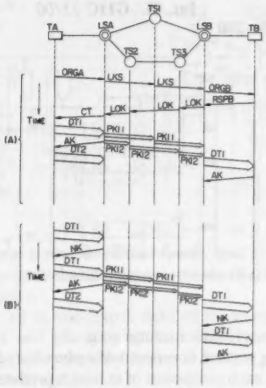
second processing means to subject an output from said noise suppressing means to a filtering processing for performing a smoothing processing.

4,074,232

DATA SENDING AND RECEIVING SYSTEM FOR PACKET SWITCHING NETWORK

Koju Otomo; Takeshi Itoh, both of Musashino; Kazuyuki Hayashi, Yokohama; Hiroshi Omoto; Takayuki Yui, both of Tokyo, and Makoto Suzuki, Kawasaki, all of Japan, assignors to Hitachi, Ltd.; Nippon Telegraph and Telephone Public Corporation; Oki Electric Industry Co., Ltd.; Nippon Electric Company, Ltd. and Fujitsu Limited, all of Japan

Filed Mar. 2, 1976, Ser. No. 663,048
Claims priority, application Japan, Mar. 3, 1975, 50-25007
Int. Cl.[2] H04Q 9/00
U.S. Cl. 340—147 R 3 Claims



1. A packet switching system comprising a packet switching network having office-to-office channels for connecting between packet switching offices, and data communication channels for connecting between data communication sending and receiving terminals and said packet switching offices;

wherein a data communication is conducted by a single communication link established prior to the beginning of the data communication, from one of said data communication sending terminals to one of said data communication receiving terminals through one of said office-to-office channels in accordance with a character oriented transmission control procedure, said single communication link being disconnected in accordance with said character oriented transmission control procedure after said data communication;

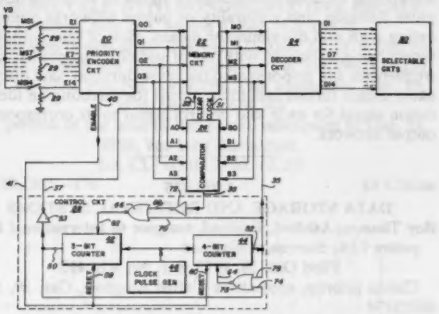
and wherein, after the establishment of said single communication link for transmitting a data block from said sending terminal to said receiving terminal through said packet switching network, a checking answer is provided in accordance with said transmission control procedure, said checking answer associated with the data block being transmitted from said packet switching office connected by said data communication channel to said data communication sending terminal; and after the transmission of said data block to said data communication receiving terminal, a checking answer is transmitted from said data communication receiving terminal in accordance with said transmission control procedure, said checking answer associated with the data block being received by said packet switching office connected by said data communication channel to said data communication receiving terminal to inhibit the transmission of said checking answer into said packet switching network.

4,074,233

SELECTION SWITCH MEMORY CIRCUIT

Richard Slaughter Swain, Des Plaines, Ill., assignor to Norlin Music, Inc., Lincolnwood, Ill.

Filed June 30, 1976, Ser. No. 701,391
Int. Cl.[2] H04Q 9/00
U.S. Cl. 340—147 LP 35 Claims



1. In a selection circuit having a plurality of actuateable swtiches and a plurality of selectable circuits associated therewith, a switching circuit for selectively activating said selectable circuits, comprising:

means for providing a code representative of any one of said switches in response to actuation thereof;

storage means for storing the provided code;

means for comparing the stored code with a subsequently provided code; and

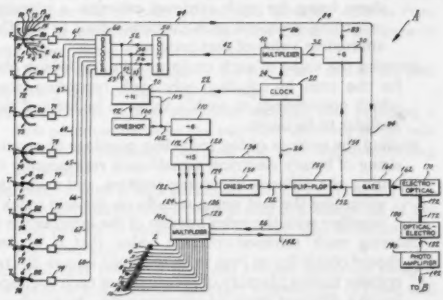
means responsive to said comparing means for controlling activation of said selectable circuits, said controlling means deactivating an activated one of said selectable circuits in response to the provided code being the same as the stored code.

4,074,234

CONTROL SYSTEM FOR AN AERIAL DEVICE

Charles W. Fox, Clayton, Mo., assignor to McCabe-Powers Body Company, St. Louis, Mo.

Continuation of Ser. No. 463,903, April 25, 1974, abandoned, which is a division of Ser. No. 263,648, June 16, 1972, Pat. No. 3,820,070. This application Apr. 15, 1975, Ser. No. 568,174
Int. Cl.[2] H04Q 9/00
U.S. Cl. 340—171 R 4 Claims



1. In combination, encoder means comprising a plurality of individually controllable signal control means for effecting production of a plurality of pulse form control signals in a rapidly repeating sequence, said signals being characterized by a selected frequency for each individually controllable signal control means and each frequency signal having a selected pulse duration dependent upon actuation of the respective individually controllable signal control means, electrical-opti-

cal means for converting said control signals to light signals, a flexible light transmitting fiber adapted to transmit said differing control signals from said encoder means in a non-linear path to a location remote from said encoder means, optical-electro means and discriminator means provided at said remote location for receiving said differing control signals from said encoder means, said discriminator means including means for identifying each differing control signal as to frequency and pulse duration, and a plurality of output networks communicating with said discriminator means, each of said output networks being associated with one of said differing control signal frequencies and responsive to the pulse duration, said discriminator means further including means for directing an identification signal for each said control signal to its corresponding output network.

4,074,235
DATA STORAGE AND RETRIEVAL SYSTEMS

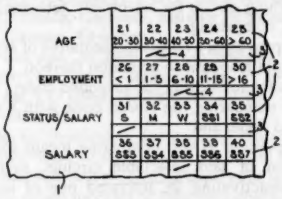
Roy Thomas, Ashford, England, assignor to International Computers Ltd., Stevenage, England

Filed Oct. 28, 1975, Ser. No. 626,495

Claims priority, application United Kingdom, Oct. 29, 1974, 46815/74

Int. Cl.² G06F *7/04*

U.S. Cl. 364—900 **7 Claims**



1. A process for retrieving, from a file of information items each identified by an index number, the index number of each item for which a desired value obtains for each of a predetermined number of retrieval criteria, the process comprising:

forming a magnetically recorded index tape separate from the file of information items by, for each information item, carrying out the steps of:

providing a criteria recorder having a plurality of recording positions each capable of recording only a single bit by being either set or unset, each recording position corresponding to a value of a retrieval criterion, and there being for each retrieval criterion a plurality of recording positions each corresponding to a different alternative value of that criterion,

entering the value of each retrieval criterion which obtains for the item by causing only each recording position which corresponds to such a value to be set and the remainder to be unset,

reading the settings of the recording positions to generate a string of binary electrical signals each representing the setting of a different recording position, and magnetically recording the said string serially on the said index tape together with the index number of the information item;

entering each retrieval-criterion value that it is desired should obtain for an item to be retrieved into an electronic register having plurality of binary stages each corresponding to a different retrieval-criterion value, by causing each stage which corresponds to a desired retrieval-condition value to be set, the remainder being unset;

reading the tape to obtain, for each information item, the said recorded string of binary electric signals and index number,

outputting the contents of the aid register as a plurality of binary electrical signals each representing the setting of a different one of the said stages;

comparing each binary signal of the said string with the binary signal representing the corresponding stage of the said register; and

displaying the index number of each item for which a predetermined number of signals representing set stages in the said register match the corresponding signals in the said string, thereby displaying the index number of each informtion item for which a desired value obtains for each of a predetermined number of retrieval criteria.

4,074,236
MEMORY DEVICE

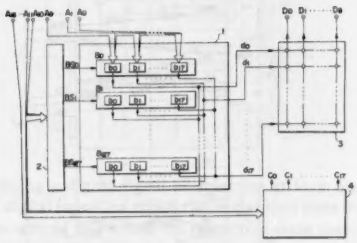
Akira Ishida, Tokyo, Japan, assignor to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Dec. 12, 1975, Ser. No. 640,227

Claims priority, application Japan, Dec. 16, 1974, 49-144243

Int. Cl.² G11C *13/00*

U.S. Cl. 365—200 **6 Claims**



1. A memory device comprising:

a memory portion composed of a plurality of major memory blocks, each composed of at least a predetermined number of minor memory blocks, the minor memory blocks being respectively composed of a plurality of memory cells for data storage and the major memory blocks being respectively given addresses corresponding thereto;

a control information registration portion for registering and storing information as to whether or not each of the minor memory blocks making up each of the major memory blocks includes a defective memory cell;

a block select portion for selecting one of the major memory blocks; and

an input/output control portion connected to data bus lines for reading out the control information registered and stored in the control information registration portion corresponding to the major memory block selected by the block select portion to select a predetermined number of minor memory blocks having no defective memory cell from the group of minor memory blocks making up the selected major block and to interconnect those selected to the bus lines to cause them to perform data inputting and outputting.

4,074,237
WORD LINE CLAMPING CIRCUIT AND DECODER

Dominic Patrick Spampinato, Ozone Park, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 8, 1976, Ser. No. 665,144

Int. Cl.² G11C *7/00*

U.S. Cl. 365—230 **7 Claims**

1. A word line clamping circuit comprising

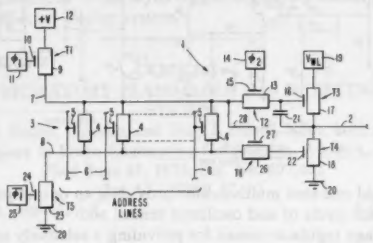
a memory array word line,

a decoder circuit adapted for operating in a selected and nonselected mode including a plurality of actuable field effect transistors,

means connected to said word line for applying word line potential to said word line when said word line is selected including a first field effect transistor having source, drain

and gate electrodes and a bootstrap capacitor connected across the drain and gate electrodes thereof,

means connected to said decoder and said word line for clamping said word line to a reference potential when said word line is unselected including a second field effect transistor having source, drain and gate electrodes connected between said word line and said reference potential, third, fourth and fifth field effect transistors each having source, drain and gate electrodes and at least one of said plurality of actuable field effect transistors operable during a first interval for applying charge to said first and second field effect transistors rendering them operable, the source electrode of said fourth field effect transistor being connected to the gate electrode of said fifth field effect transistor,



means connected to said fourth field effect transistor and at least one of said plurality of field effect transistors for maintaining them operable during at least a portion of a second interval, and,

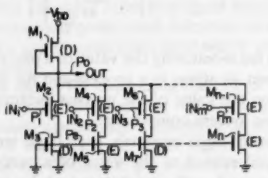
means connected to said fifth field effect transistor for rendering it inoperable during said second interval to trap charge on said gate of said second field effect transistor holding said last-mentioned transistor operable and maintaining reference potential on said word line.

4,074,238

SEMICONDUCTOR READ-ONLY MEMORY

Kenzo Masuda, Tokorozawa, Japan, assignor to Hitachi, Ltd., Japan

Filed Mar. 12, 1976, Ser. No. 666,426
Claims priority, application Japan, Mar. 26, 1975, 50-35598
Int. Cl.[2] G11C *11/40, 13/00*
U.S. Cl. 365—104 **8 Claims**



1. A read-only memory comprising:

a first and a second line;

a plurality of information memory circuits connected in parallel with one another across said first and second lines, each said memory circuit comprising a pair of insulated-gate field effect transistors connected in series with each other across said first and second lines, one of said insulated-gate field effect transistors in each said information memory circuit in which information is to be written being of depletion mode, while the other said insulated-gate field effect transistor being of enhancement mode;

means for supplying electric power to said information memory circuits; and

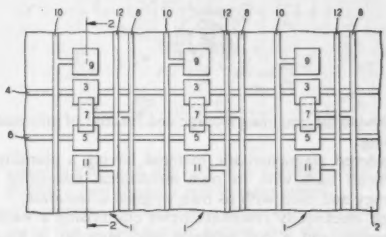
means for reading out the information written in said information memory circuits.

4,074,239

MEMORY CELL WITH NONDESTRUCTIVE RECALL

Roger T. Baker, Box 240, Mount Tabor, N.J. 07878

Continuation-in-part of Ser. No. 642,721, Dec. 22, 1975, Pat. No. 4,015,247, which is a continuation-in-part of Ser. No. 613,189, Dec. 14, 1976, Pat. No. 3,997,799. This application Mar. 25, 1976, Ser. No. 670,143
The portion of the term of this patent subsequent to Dec. 14, 1993, has been disclaimed.
Int. Cl.[2] G11C *7/00, 11/34*
U.S. Cl. 365—176 **14 Claims**



11. In the class of semiconductor random access memories wherein

a plurality of first electrodes and a semiconducting substrare are utilized to form a plurality of memory cells,

in each of said memory cells one of said first electrodes is utilized to form in said semiconducting substrate a first localized minimum potential energy region for one polarity of mobile charge carriers in said semiconducting substrate,

in each of said memory cells a one is represented by storing a relatively large number of mobile charge carriers of said polarity in the said first localized minimum potential energy region of that said memory cell,

in each of said memory cells a zero is represented by storing a relatively small number of mobile charge carriers of said polarity in the said first localized minimum potential energy region of that said memory cell,

the said memory cells are interconnected such that the said first electrode of each of the said memory cells is connected in common with the said first electrode on some of the other of the said memory cells,

a method of entering datum in any particular one of the said memory cells, comprising the steps of

to enter a one in said particular memory cell, applying a first potential between the said first electrode of the said particular memory cell and the said semiconducting substrate,

to enter a zero is said particular memory cell, applying a second potential between the said first electrode of the said particular memory cell and the said semiconducting substrate,

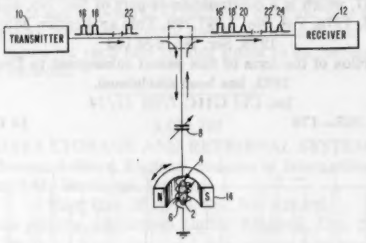
both said first potential and said second potential being a magnitude and polarity such that when either of these said potentials are applied between the said first electrode of one of the said memory cells and the said semiconducting substrate, a localized minimum potential energy region for said polarity of mobile charge carriers is formed in said semiconducting substrate, and

the localized minimum potential energy region so formed by so applying either said first potential or said second potential can be used to store the said relatively large number of mobile charge carriers of said polarity used to represent a one in one of said memory cells.

4,074,240
MAGNETOELASTIC STORAGE DEVICE

Robert Lee Melcher, Yorktown Heights, and Norman Steven Shiren, Ossining, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 20, 1976, Ser. No. 659,872
Int. Cl.[2] G11C *11/02*
U.S. Cl. 365—192 10 Claims



1. A device for obtaining storage and readout of information comprising:

a powdered magnetoelastic material having a plurality of particles each with its own mechanical resonance frequency and each with its own original orientation,

a tuned electrically resonant circuit comprising a variable capacitor and a coil wherein said material is located within said coil for providing an oriented radiofrequency magnetic field within said material,

a d. c. magnet for applying a magnetic field to said powder at an angle to the field created by radiofrequency current through said coil,

means for applying a first r. f. pulse as an information-bearing pulse to said electrically resonant circuit for causing said particles of said powdered material to oscillate mechanically at said mechanical resonance frequencies,

means for applying a second r. f. pulse with peak power above a minimum power to said electrically resonant circuit to cause said mechanically oscillating particles to rotate to new orientations because said minimum power is exceeded, said second r. f. pulse serving to store the information-bearing pulse as said new orientations, and

means for applying a third r. f. pulse to said electrically resonant circuit so as to obtain a readout signal of said stored information.

4,074,241
RADIOSONDE CIRCUITRY FOR IMPEDANCE MEASUREMENT OF AN AL_2O_3 ABSOLUTE WATER VAPOR SENSOR

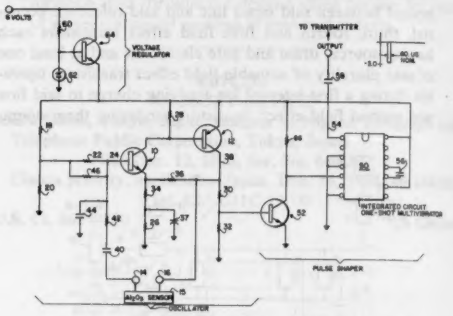
Paul Kranz, Harvard, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 24, 1974, Ser. No. 536,077
Int. Cl.[2] G08C *19/16, 17/00*
U.S. Cl. 340—189 M 1 Claim

1. A circuit for measuring the impedance of an Al_2O_3 water vapor sensor used in a radiosonde telemetry system, which system has a transmitter, said circuit comprising:

oscillator means for producing a temperature stabilized cyclical output, said oscillator means having an Al_2O_3 water vapor sensor as a feedback frequency-control element, the frequency of said oscillator being independent of temperature effects, said oscillator means includes first and second transistors, the collector of said second transistor being connected through said sensor to the base of said first transistor, the collector of said first transistor being connected to the base of said second transistor;

pulse shaping means for receiving the output from said oscillator means and converting it to a pulse suitable for modulating the transmitter of said radiosonde, said pulse shaping means includes a buffering transistor, the base of said buffering transistor being connected to the collector of said second transistor, said pulse shaping means further includes a one-shot multivibrator integrated circuit connected to the collector output of said buffering transistor,



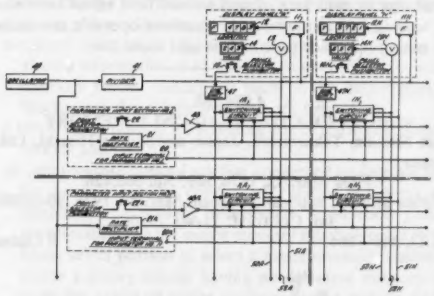
said one-shot multivibrator providing an output pulse for each cycle of said oscillator means; and

voltage regulator means for providing a relatively constant dc voltage input to said oscillator means and said pulse shaping means.

4,074,242
POINT SELECTION AND DISPLAY SYSTEM

Robert Mayer, Ardmore, Pa., assignor to Suntech, Inc., Wayne, Pa.

Filed Nov. 24, 1975, Ser. No. 634,691
Int. Cl.[2] H04Q *9/00*
U.S. Cl. 340—213.1 7 Claims



1. A system for monitoring the value of a plurality of parameters at different locations in a process and for displaying at a central location the value of the process parameters selected, said monitoring system comprising:

(a) a plurality of input terminals, each input terminal receiving a signal related to the value of a particular process parameter, and each input terminal having associated therewith parameter selection means for allowing that input terminal to be selected to monitor its process parameter, and for producing a signal indicative of its selection;

(b) a plurality of display systems, each display system having means for displaying the value of a selected process parameter, and each display system having associated therewith display system selection means for allowing that display system to be selected to display the value of a selected parameter, and for producing a signal indicative of its selection;

(c) a matrix of switching circuits, each switching circuit coupling an input terminal with a display system, and each switching circuit comprising,

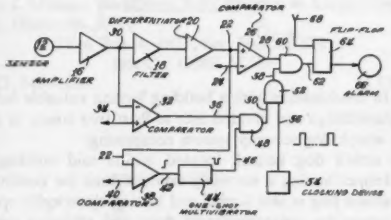
(i) means, responsive to a signal from the display system selection means associated with that switching circuit, for placing the switching circuit in a first enabled mode wherein an open circuit is produced between the input terminal and the displaying means, whereby all the switching circuits coupled to a particular display system are placed in a first enabled mode,

(ii) means, responsive to the switching circuit being placed in said first enabled mode and further responsive to a signal from the process parameter selection means associated with that switching circuit, for placing the switching circuit in a second mode wherein a closed circuit is produced between the input terminal and the displaying means, and the value of the selected process parameter is displayed by the displaying means of the selected display system.

4,074,243
ANTICIPATORY FLAMMABLE GAS DETECTION SYSTEM

John S. Bogen, Chicago, and Gary I. Robin, Niles, both of Ill., assignors to Erdco Engineering Corporation, Addison, Ill.

Filed June 18, 1976, Ser. No. 697,452
Int. Cl.[2] G08B 17/10
U.S. Cl. 340—237 R 9 Claims



1. A flammable gas detection system, comprising, in combination:

flammable gas sensing means for sensing the flammable gas concentration level of a mixture of flammable and non-flammable gas, said flammable gas sensing means including a transducer for effecting an indicating signal proportional to said flammable gas concentration level;

a differentiator for generating a rate of change signal in response to the rate of change of said flammable gas concentration level;

reference signal means for effecting a continually changing reference signal which varies as a function of time, said continually changing reference signal being proportional to a non-constant preselected reference rate of change of flammable gas concentration level which varies as a function of time;

comparator means for comparing the rate of change signal with the continually changing reference signal; and

control means operatively responsive to the comparing means for energizing an alarm signal when the rate of change of the flammable gas concentration level exceeds the non-constant preselected reference rate of change of said flammable gas concentration level.

4,074,244
AUDIBLE-VISUAL WARNING ALARM SYSTEM

Robert Bruce Balderson, 53 Pueblo Road, New Britain, Pa. 18901

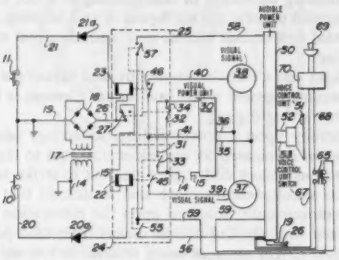
Filed July 18, 1975, Ser. No. 597,207
Int. Cl.[2] G08B 23/00
U.S. Cl. 340—244 R 8 Claims

1. A warning alarm system comprising

a pair of different visual signals, p1 audible signal means having a pair of different delivered signals corresponding respectively to each of the visual signals and having speaker means for delivery of said audible signals,

signal input means responsive to a plurality of conditions,

control means for said visual signals and said audible signal means responsive to one condition for maintaining said visual and audible signals in an inactive condition and to different predetermined conditions of warning for selectively simultaneously initiating one of said visual signals and delivery of a corresponding audible signal through said speaker means for one condition of warning and for selectively simultaneously initiating a different one of said



visual signals and delivery of a corresponding different audible signal through said speaker means,

said control means including members for providing a priority of one of said audible signals over the other,

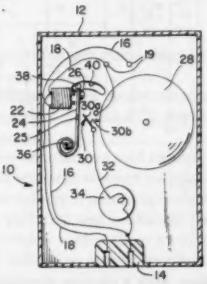
auxiliary voice input means including a microphone selectively connected to said speaker means,

said voice input means including members for cutting off audible alarm signals to said speaker means and connecting said microphone to said speaker means thereby overriding said audible signal means without overriding said visual signals.

4,074,245
POWER FAILURE ALARM

John P. Podany, 8299 Mitchell Road, Eden Prairie, Minn. 55343

Filed July 19, 1976, Ser. No. 706,259
Int. Cl.[2] G08B 21/00
U.S. Cl. 340—248 B 4 Claims



1. A power failure alarm device comprising:

a housing,

first electric circuit means in said housing for electrically connecting an electrical appliance in series to a power source,

an electromagnet connected to said first electric circuit means and energized by said first electric circuit means only when power is supplied to said first electric circuit means from said power source, and

an audible alarm in said housing, said audible alarm including

a gong mounted in said housing, and

a movable striker element normally restrained by said electromagnet in spaced relation to said gong, spring means mounted within said housing for moving said striker element in a direction away from said electromagnet and to strike said gong when said electromagnet is de-energized by an interruption of power supplied to said first electric circuit means from said power source, said gong being spaced from said electromagnet a distance sufficient to assure that said striker element will not be automatically attracted in a reverse direction back toward said electromagnet when said electromagnet is re-energized and a post mechanically connected to said striker element extending exteriorly of said housing in a slot therethrough,

a second electric circuit means in said housing in parallel to said first circuit means, said second circuit means including

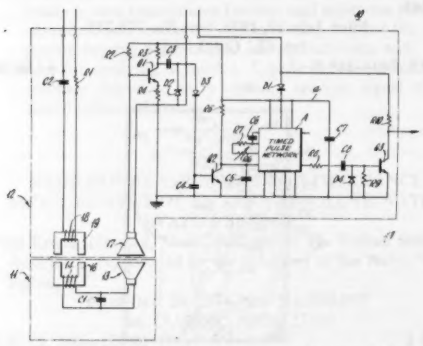
a light and a switch closable by said means for moving said striker element when said striker element is being moved toward said gong,

whereby upon a power failure occurring, said striker element is released by said electromagnet so that said spring means causes said striker element to strike said gong and to simultaneously close said switch so that said light is automatically actuated upon the restoration of power to said first electric circuit means from said power source, said striker element being returnable toward said electromagnet only by manually sliding said post in said slot towards said electromagnet, the actuation of said light indicating that power has been restored and that said post can be manually slid toward said electromagnet and that said striker element will then again be restrained by said electromagnet.

4,074,246
CONTACT SYSTEM FOR SENSING CLOSURES

Robert M. Conklin, Chappaqua, N.Y.; Charles J. Everett, Clinton, and Arthur T. Human, Norwalk, both of Conn., assignors to Holmes Protection, Inc., New York, N.Y.

Filed Feb. 17, 1976, Ser. No. 658,445
Int. Cl.[2] G08B *13/08*
U.S. Cl. 340—274 R **15 Claims**

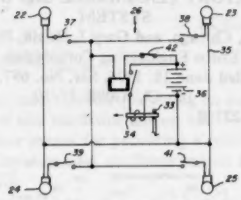


1. In combination with a closure member movable between a closed and open position relative to a stationary member, a system for sensing the position of said closure member relative to said stationary member comprising a first transducer having an electrical input signal and an output signal of predetermined type and mounted on one of said members, a second transducer having an input signal of said predetermined type and an electrical output, said first and second transducers being tightly coupled by said predetermined type signal output of said first transducer when said closure member is in closed position producing an output signal from said second transducer and being relatively uncoupled when said closure member is in open position producing a signal change, and means responsive to the output signal of said second transducer, said predetermined signal type comprising sound, said first transducer comprising an electro-mechanical transducer and said second transducer comprising a mechanical-electrical transducer operable in the sound frequency range, a first coil on said stationary member, means adapted to connect said first coil to a source of alternating current, and a second coil on said closure member electrically connected to said first transducer and magnetically coupled to said first coil when said closure member is in said closed position.

4,074,247
ATTACK DOG SECURITY SYSTEM

Ronald M. Carvalho, Box 175, Groton St., Dunstable, Mass. 01827

Filed Jan. 17, 1977, Ser. No. 760,094
Int. Cl.[2] G08B *13/00*
U.S. Cl. 340—276 **6 Claims**



1. In combination with a building having valuable furniture and furnishings and divided into at least two zones, or areas; an attack dog security system comprising:

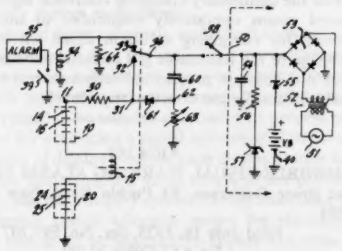
an attack dog kennel, located within said building, said kennel having a normally latched door for confining an attack dog in said kennel and having electrically operated means for unlatching said door and releasing said dog from said kennel; and

electric burglar alarm circuit means including a source of electricity, said electrically operated means; alarm means and sensing means, said circuit activating the alarm of said alarm means and activating said electrically operated door unlatching means upon sensing an intruder in said building.

4,074,248
DUAL OPERATING CONTROL CIRCUITS FOR INTRUSION DETECTION SYSTEMS

Roy Stockdale, Huntington, N.Y., assignor to Napco Security Systems, Inc., Copiaque, N.Y.

Filed Nov. 22, 1976, Ser. No. 743,539
Int. Cl.[2] G08B *13/08*
U.S. Cl. 340—276 **10 Claims**



1. An intrusion detection system comprising:

(a) a series loop including a plurality of intrusion sensing devices operative in a first closed position to indicate a

secured condition and a second opened position to indicate an intrusion,

(b) control means adapted when energized to operate in a first position and in a second position when deenergized, said control means including a current activated actuator to operate said control means to said first position when a current flows through said actuator and means for coupling said actuator in series with said loop,

(c) an alarm coupled to said control means and responsive to said control means operative in said second position to indicate an alarm condition,

(d) means for providing a biasing current of a predetermined duration to said loop and hence, said actuator, in a first mode, to cause said actuator to operate said control means to said first position and

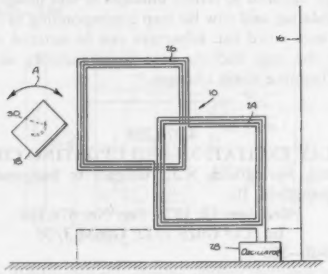
(e) means responsive to said control means operative in said first position for providing a second current to said loop, wherein if said loop is opened and closed during said predetermined duration, said means for providing a biasing current will again operate said actuator, and thereafter said actuator is biased by said means responsive to said control means.

4,074,249

MAGNETIC DETECTION MEANS

Arthur J. Minasy, Woodbury, N.Y., assignor to Knogo Corporation, Hicksville, N.Y.

Filed Feb. 4, 1977, Ser. No. 765,582
Int. Cl.² G08B *13/26*
U.S. Cl. 340—280 **11 Claims**



6. A target for a magnetic detection system of the type in which an alternating interrogating magnetic field is generated at an exit passageway and magnetic fields, which alternate at frequencies harmonically related to the interrogating field, are detected at said passageway, said target comprising an elongated strip of readily saturable magnetic material, said strip being curved along its length.

4,074,250

ALARM BOX WITH FINGERPRINT RECORDER

Stephen Robert Cooper, 246 Sunrise Hill Court, Norwalk, Conn. 06851

Filed Apr. 27, 1976, Ser. No. 680,845
Int. Cl.² G08B *29/00*
U.S. Cl. 340—304 **10 Claims**

1. A voice call alarm box comprising:

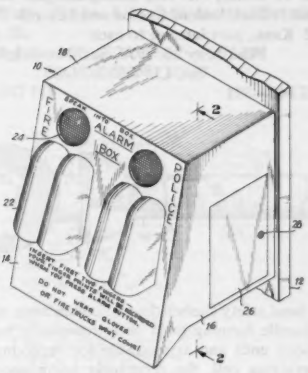
(a) a housing,

(b) circuit means contained within said housing for activation of an alarm at a remote location,

(c) switch means for selection activation of said circuit means,

(d) voice transmission means disposed within said housing for establishing oral communication between each successive operator of said alarm box and said remote location,

(e) means cooperating with said switch means for obtaining and preserving at least one fingerprint of said each successive operator, and



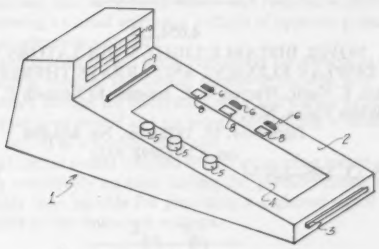
(f) means for transmitting a facsimile of said at least one fingerprint to said remote location.

4,074,251

APPOINTMENT REMINDERS

William G. Creely, 1400 E. Duschesne, Florissant, Mo. 63031

Filed May 3, 1976, Ser. No. 682,716
Int. Cl.² G08B *7/00*
U.S. Cl. 340—309.4 **1 Claim**



1. An appointment reminder comprising,

a cabinet means,

a plurality of message storage means mounted in said cabinet means, comprising a plurality of paper strips mounted upon a message tray,

a viewing window mounted in said cabinet means to permit viewing of said message storage means,

a plurality of time selection means operably mounted in said cabinet means and disposed proximate each message storage means, provided with a timer switch,

audio and visual indicating means operably mounted in said cabinet means,

a plurality of message lighting means operably mounted in said cabinet means and disposed proximate each message,

electric power supply means operably mounted in said cabinet means,

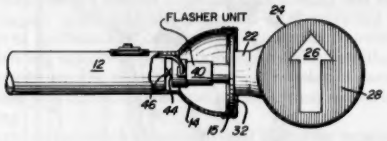
a plurality of message activation switches operably mounted in said cabinet means, each of said message activation switches connected in series with a timer switch and also in series between said power supply and said message lights and said indicator means,

override means comprising a switch and conductor means operably mounted in said cabinet means and connected in series between said power supply and all message lights simultaneously to view stored messages simultaneously.

4,074,252
HAND SAFETY FLASHER

Herman F. Keller, Newton, Kans., assignor to Leon Nikkel; Kermit Nikkel, both of Canton and Lelus B. Brown, Newton, all of Kans., part interest to each

Filed May 20, 1976, Ser. No. 688,484
Int. Cl.[2] G08B 23/00
U.S. Cl. 340—321 7 Claims

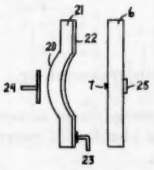


1. A hand safety flasher device, comprising, in combination:
a. a handle forming main body receptacle having a pair of spaced ends and arrangeable for receiving an electrical energizing cell, the receptacle being provided with an enlarged head portion at one of the ends thereof, the head portion having an opening therein for receiving the cell;
b. an on-off switch mounted on the receptacle and arranged for selectively closing and opening a circuit through the cell received in the receptacle; and
c. flasher means mounted on the enlarged head portion, and including a direction and warning indicating portion arranged extending away from the receptacle and a flasher unit extending into the receptacle and contacting a pole of the cell received in the receptacle, an electrical circuit being formed from the cell through the switch, flasher unit, and direction and warning indicating portion.

4,074,253
NOVEL BISTABLE LIGHT MODULATORS AND DISPLAY ELEMENT AND ARRAYS THEREFROM

Mark T. Nadir, Warren, N.J., assignor to Kenneth E. Macklin, White Plains, N.Y.

Filed Nov. 19, 1975, Ser. No. 633,494
Int. Cl.[2] G09F 9/32
U.S. Cl. 340—324 M 11 Claims



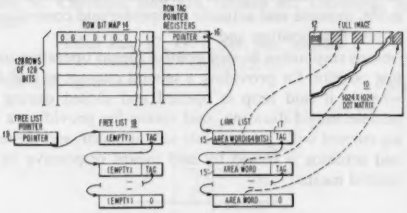
1. A bistable light modulator which comprises:
(a) a curved flexible membrane which is adapted to assume only either a stable concave or stable convex configuration and
(b) optical means positioned in accordance with one of the two stable states for enhancing the visibility of one of the two stable states.

4,074,254
XY ADDRESSABLE AND UPDATEABLE COMPRESSED VIDEO REFRESH BUFFER FOR DIGITAL TV DISPLAY

Karl Arnold Belser, Campbell, and Philip Bradshaw Metz, Saratoga, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 22, 1976, Ser. No. 707,803
Int. Cl.[2] G06F 3/14
U.S. C:. 340—324 AD 4 Claims

1. An apparatus for mapping compressed image information between a refresh buffer and an image display device by dividing the image into small subarrays such that only non-zero subarrays are represented in the refresh buffer,
said apparatus comprising: an area word memory for storing subarray information, each word containing dot matrix segments of a pictorial image;
row bit maps means for storing first manifestations designating active each subarray in which points are plotted and second manifestations designating inactive each subarray in which no points are plotted, said active subarrays being stored in said area word memory;
a row tag pointer memory for storing pointers associated

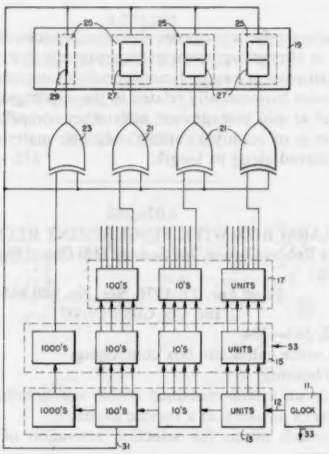


with each row of subarrays whose active subarray map is stored in said row bit map, each said pointer pointing to the first word location in said area word memory designating the first area word of a link list of chained area words corresponding to each active subarray in said designated row;
whereby said information stored in said area word memory can be updated to reflect changes in said image such that by updating said row bit map corresponding to changes in said area word list, subarrays can be entered or deleted from the map and the area word memory as their active/inactive status changes.

4,074,255
DISPLAY EXCITATION AND UPDATING CIRCUIT

Irwin Munt, Springfield, N.J., assignor to Sangamo Weston, Inc., Springfield, Ill.

Filed Apr. 12, 1976, Ser. No. 676,186
Int. Cl.[2] G02F 1/13; G06M 3/06
U.S. Cl. 340—336 6 Claims



1. An AC display excitation circuit for exciting the display of an electronic instrument having a multi-stage counter for accumulating pulses representative of a quantity of interest, portions of said display being bounded by pairs of electrode

means and being selectively actuable by the application of an excitation voltage across said electrode means comprising:

clock means coupled to said counter at one stage thereof for continuously driving said counter while said display is operational;

register means;

means selectably operable for synchronously transferring the count in said counter to said register means;

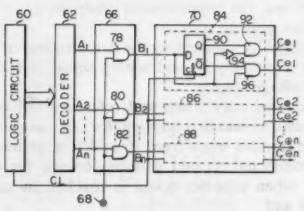
means connecting the output of a stage of said counter to one of said pair of electrode means for applying thereto an AC potential having a frequency divided from said clock frequency by the stages of said counter between said output and said stage to which said clock means is coupled; and

selectably actuable display excitation means including means for connecting the output of said stage of said counter to the other of said electrode means for selectably applying thereto either said AC potential or its complement.

4,074,256
DRIVER CIRCUIT FOR DRIVING ELECTROCHROMIC DISPLAY DEVICE

Fukuo Sekiya, and Heihachiro Ebihara, both of Tokorozawa, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Aug. 18, 1976, Ser. No. 715,523
Claims priority, application Japan, Aug. 20, 1975, 50-100231; Dec. 16, 1975, 50-149079
Int. Cl.[2] G06F 3/14; G09F 9/32
U.S. Cl. 340—336 **21 Claims**



1. In an electrochromic display device includng a common electrode and a plurality of segment electrodes, a driver circuit having a power source and connected to a decoder adapted to provide display information signals, comprising:

a drive signal generator for generating coloring and bleaching signals in response to first and second changes in state of each of said display information signals;

a switching device composed of complementary MOSFETs connected between power source and said segment electrodes and responsive to said coloring and bleaching signals to cause an electric current from said power source to flow through said segment electrodes in directions to induce colored and bleached states, respectively;

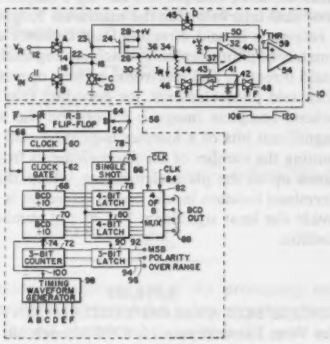
means for applying a display erase signal; and

data control circuit coupled between said decoder and said drive signal generator to normally pass said display information signals to said drive signal generator, said data control circuit being responsive to said display erase signal to block said display information signals being applied to said drive signal generator, whereby said drive signal generator simultaneously generates a plurality of bleaching signals to cause said complementary MOSFETs of said switching device to apply an electric current from said power source simultaneously to all of said segment electrodes which have previously been in a colored state in a direction to induce bleached state for thereby automatically erasing displaying data.

4,074,257
AUTO-POLARITY DUAL RAMP ANALOG TO DIGITAL CONVERTER

Tim Warren Henry, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed June 30, 1975, Ser. No. 592,131
Int. Cl.[2] H03K 13/20
U.S. Cl. 340—347 NT **12 Claims**



1. An analog-digital converter comprising:

a. input circuit means for receiving an unknown voltage to be digitized and a reference voltage,

b. an integrating means coupled to said input circuit means, said integrating means having an input and an output which is selectively coupled to said input means

c. memory means selectively coupled to said input circuit means and said integrating means and responsive thereto for storing a virtual reference voltage of opposite polarity to the reference voltage,

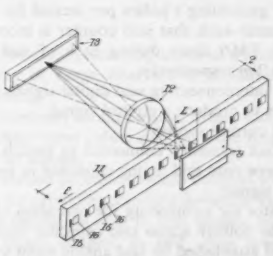
d. said integrating means being selectively responsive to the reference voltage, the virtual reference voltage, and the unknown voltage for integrating prior and during a predetermined time period and for integrating during a variable time period at a known rate, and

e. digital circuit means coupled to said integrating means and being selectively enabled during the predetermined and variable time periods for providing a digitized signal indicative of the unknown voltage.

4,074,258
DEVICE FOR READING DISPLACEMENTS OF A MOVABLE MEMBER

Alain Doré, Conflans Sainte-Honorine; Jean Picard, Versailles, and Jacques Rochereau, Montmagny, all of France, assignors to Societe d'Applications Generales d'Electricite et de Mecanique (SAGEM), France

Filed May 3, 1976, Ser. No. 682,347
Claims priority, application France, May 7, 1975, 75 14339
Int. Cl.[2] H03K 13/18
U.S. Cl. 340—347 P **9 Claims**



1. A device for reading the position of a member movable

with respect to another, comprising a scale carried by a first one of the members and having coded references distributed at equal intervals along the direction of relative movement of said members, each said coded reference being distinct from all the others and identifying the serial number of the coded reference on said scale, and an optical system which forms, on a detector carried by the other member, an image of a portion of the scale which is situated at a predetermined location with respect to said other member, said portion having a length at least equal to one of said intervals plus the maximum length of one said coded reference in said direction, said detector comprising a linear matrix of photoelements which are regularly distributed along said direction and electronic means, operatively associated with said photoelements, for decoding that coded reference whose complete image is formed on the matrix as the most significant bits of a number indicating said position and for counting the number of the photoelements from one end of the matrix up to the photoelement on which the image of a predetermined location in said coded reference is formed so as to provide the least significant bits of the number indicating said position.

4,074,259

PROCESS FOR ANALOG/DIGITAL CONVERSION

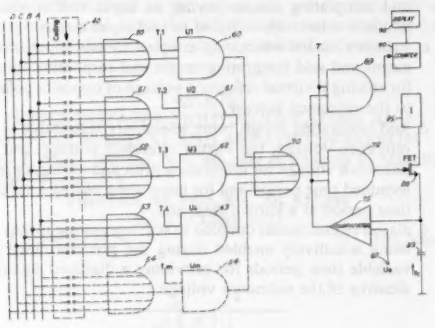
Joachim Voss, Leisanstrasse 14, 8000 Munich 60, Germany

Filed Apr. 26, 1976, Ser. No. 680,162

Claims priority, application Germany, Apr. 28, 1975, 2518914

Int. Cl.[2] H03K *13/20*

U.S. Cl. 340—347 AD **8 Claims**



1. An analog-to-digital conversion system having a programmable response curve which comprises, in combination:

a timing capacitor;

an input circuit for receiving an analog input signal;

means for generating a train of pulses for establishing successive time intervals T1 through T*m;*

a source of digital signals for establishing, within each of said intervals, subintervals during which said timing capacitor is charged;

a counter;

means for generating *t* pulses per second for incrementing said counter such that said counter is incremented T1/*t* through T*M*/*t* times during each of said intervals T1 through T*m* respectively;

means for interconnecting said digital signals and said train of pulses to produce a control signal;

a constant current source;

a field effect transistor connected to switch current from said source onto said timing capacitor in response to said control signal;

a comparator for terminating the operation of said counter when the voltage across said capacitor exceeds a threshold level established by said analog input voltage; and

output means for displaying the count present on said counter.

4,074,260

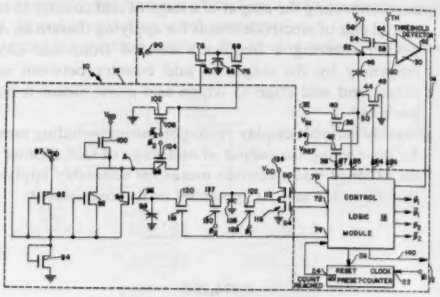
ANALOG-TO-DIGITAL CONVERTER

Walter J. Butler, Scotia, and Charles W. Eichelberger, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 24, 1976, Ser. No. 689,456

Int. Cl.[2] H03K *13/02*

U.S. Cl. 340—347 CC **10 Claims**



1. In a non-integrating, time-independent linear counting analog-to-digital converter of the type wherein an analog signal is coupled to a first terminal of a two-terminal charge storage means and having means coupled to a second terminal of said charge storage means for the metered transfer of a plurality of charge packets into and out of said charge storage means with a charge packet magnitude determined by the difference in magnitude between first and second voltages, and threshold means coupled to said second terminal of said storage means for providing an output signal when a threshold level is reached, the improvement comprising:

a reference voltage source;

switch means for connecting the first terminal of said storage means selectively to said analog signal and to said reference voltage source;

means enabled only when said reference voltage source is connected to said first terminal for counting the number of charge packets transferred to said storage means;

means connected to said counting means for providing a signal when a preset count is reached in said counting means; and

means responsive to said signal and to said output signal for adjusting the magnitude of at least one of said first and second voltages to vary the amount of charge in each of said plurality of charge packets to cause said preset count to be reached simultaneously with said output signal.

4,074,261

KEYBOARD CONTACT AND SIGNAL LINE ARRANGEMENT

Hendrik van der Gaag, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 1, 1975, Ser. No. 573,477

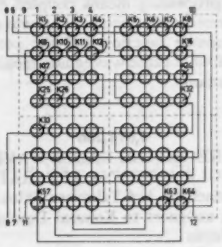
Claims priority, application Netherlands, May 6, 1974, 7406034

Int. Cl.[2] G06F *3/02*

U.S. Cl. 340—365 R **4 Claims**

1. A keyboard comprising a plurality of key elements, signal connection lines, a plurality of contact points for each of said key elements, each of said contact points including a drive contact point, wherein said contact points may be coupled to each other by means of an actuated key, said contact points of different ones of said key elements being selectively connected to each other by said signal connection lines for the transport of a drive contact signal, wherein for a predetermined number of correspondingly constructed key elements, said predetermined number being equal to the product, $n \times m \times p$, of three non-negative integers, there are provided $n + m + p$ signal connection lines, each signal connection line of a group of *n, m,*

and p signal connections, respectively, being selectively connected to a corresponding contact point of at most $m \times p$, at most $n \times p$, and at most $m \times n$, key elements, respectively,



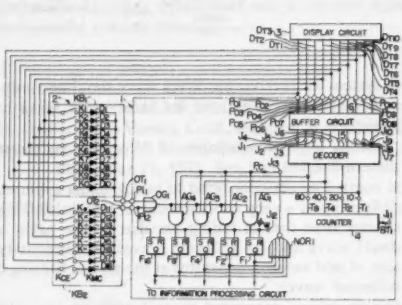
each key element being connected to a single signal connection line of each of the groups of n, m and p signal connections, wherein n, m and p are predetermined non-negative integers.

4,074,262

KEY INPUT CIRCUIT

Kosei Nomiya, Tokyo, and Shinkichi Hotta, Kodaira, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 27, 1976, Ser. No. 652,661
Claims priority, application Japan, Jan. 31, 1975, 50-12583
Int. Cl.[2] G06F 3/02
U.S. Cl. 340—365 S **15 Claims**



9. A key input circuit for coding a plurality of key information inputs to electrical signals for application to an information processing system, comprising:

binary-coded N-ary counter means for producing N combinations of binary-coded signals by counting a first timing pulse signal applied to said counter means;

decoder means for converting each one of said binary-coded signals from said binary-coded N-ary counter means into N second timing pulse signals;

key switch circuit means having a plurality of input terminals connected to receive the respective outputs of said decoder means and at least one output terminal and including a plurality of key switches corresponding respectively to a plurality of key information inputs, one end of said key switches being connected with different ones of said input terminals of said key switch circuit means and the other ends of said key switches being connected with said one output terminal of said key switch circuit means, the number of said output terminals being smaller than that of said input terminals;

gate circuit means having first input terminals connected to receive the outputs of said binary-coded N-ary counter means and second input terminals connected in common to receive one of said N second timing pulse signals associated with an operated one of said key switches; and

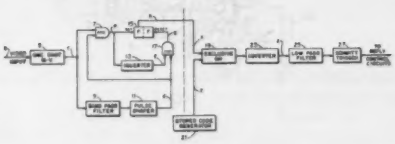
means for connecting said output terminal of said key switch circuit means with said second input terminals of said gate circuit means.

4,074,263

CODE SIGNAL PROCESSING CIRCUITRY FOR IFF TRANSPONDER BEACON

Albert M. Sullivan, Jr., Ellicott City, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 27, 1969, Ser. No. 795,774
Int. Cl.[2] G01S 9/56
U.S. Cl. 343—6.8 LC **4 Claims**



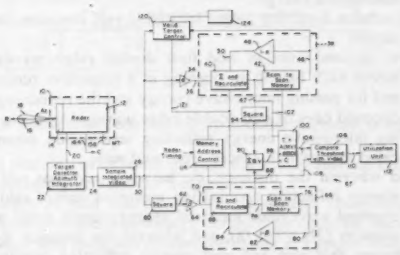
1. Transponder beacon circuitry for processing received binary coded signals, comprising a received radar video pulse train which is time modulated in accordance with a binary code, means to extract the binary code from said pulse train in two-level form, said means including a resonant filter tuned to the pulse repetition frequency of said radar video pulse train and a pulse shaper in cascade therewith and wherein said resonant filter is shock excited by said received video pulse train, whereby said pulse shaper produces an unmodulated video pulse train, and means for correlating said extracted binary code with a locally stored code which is run at a different bit rate than said extracted binary code.

4,074,264

ADAPTIVE THRESHOLD CLUTTER PROCESSOR

Richard D. Wilmont, Buena Park, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 7, 1976, Ser. No. 647,226
Int. Cl.[2] G01S 7/30, 9/02
U.S. Cl. 343—17.1 R **10 Claims**



1. A target detector system responsive to a source of signals over a plurality of range intervals of a plurality of range sweeps comprising:

mean level processor means coupled to said source of signals for providing mean values derived from time samples of scan to scan signals,

standard deviation processor means coupled to said source of signals for providing standard deviation values derived from time samples of scan to scan signals; and

combining means coupled to said mean level processor means and said standard deviation processor means for providing a target detection threshold.

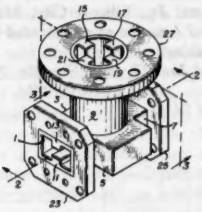
4,074,265
MICROWAVE POWER COMBINER

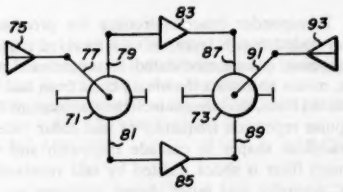
Richard Brownell True, Sunnyvale, Calif., assignor to Litton Systems, Inc., San Carlos, Calif.

Continuation-in-part of Ser. No. 504,456, Sept. 9, 1974, Pat. No. 3,986,188. This application Sept. 20, 1976, Ser. No. 724,930

Int. Cl.² G01S 7/38; H01P 5/12

U.S. Cl. 343—18 E **1 Claim**





1. An electronic countermeasures system operable at a frequency, *f*, of wavelength λ comprising a receiving antenna, a transmitting antenna, first and second microwave energy coupling turnstile junctions each of which comprises:

four double ridge waveguide means, said waveguide means arranged in the form of a cross centered about an axis with an end of each opening into a common central region;

fifth quadridge circular waveguide means extending along said axis located at the juncture of said formed cross oriented orthogonal to said four waveguide means, said fifth waveguide means having an end in communication with said common central region, and said waveguide means having the remaining end thereof open for passing microwave energy;

impedance matching means located in said common central region;

two opposed ones of said four double ridge waveguide means each having an opening at a respective remaining end for passing microwave energy and the remaining two opposed ones of said double ridge waveguide means having microwave energy reflecting termination means located therewithin spaced from said axis;

and wherein the distance, d_1, between said axis and said energy reflecting termination means of one of said two opposed waveguide means is approximately equal to the quantity $(2N+3)(\lambda/8)$; and wherein the distance, d_2, between said axis and said energy reflecting termination means of the remaining one of said two opposed waveguide means is approximately equal to the quantity $(2N+1)(\lambda/8)$, where N is an integer, including zero, and where λ equals one wavelength at the frequency *f*;

the effective distance between said reflecting termination means being equal to one-half wavelength, λ, at said frequency *f*;

means connecting the output of said receiving antenna to said fifth waveguide means of said first coupling turnstile junction;

means connecting the input of said transmitting antenna to the fifth waveguide means of said second coupling turnstile junction;

first signal processing means coupled between an end opening of one double ridge waveguide means of said first turnstile junction and the corresponding end opening of double ridge waveguide means of said second turnstile junction; and

second signal processing means coupled between the end opening of remaining double ridge waveguide means of said first turnstile junction and the corresponding end opening of double ridge waveguide means of said second turnstile junction.

4,074,266
SYSTEM FOR RECEIVING RADIO WAVES THROUGH SINGLE ANTENNA APPARATUS

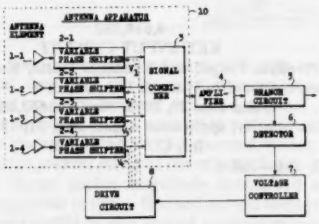
Hiroshi Yokoi, Machida, and Takayasu Shiokawa, Yokohama, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed June 4, 1976, Ser. No. 692,778

Claims priority, application Japan, June 9, 1975, 50-68639

Int. Cl.² H04B 7/10

U.S. Cl. 343—100 SA **6 Claims**



1. A system for receiving a direct wave simultaneously with reflected waves arriving from the same radio wave source comprising:

an antenna apparatus capable of deforming its directivity pattern;

first control means connected to said antenna apparatus for deforming by a very small amount, at intervals sufficiently shorter than that of fading peculiar to the paths of the direct wave and the reflected waves, the directivity pattern of said antenna apparatus at the arrival bearing of the reflected waves;

detection means connected to said antenna apparatus for detecting the resultant level of the direct wave and the reflected waves at said intervals to provide error voltages each indicative of the polarity of a difference between the directivity pattern of said antenna apparatus and an optimum pattern; and

second control means connected to said first control means and said detection means for controlling said first control means by a control voltage produced from said error voltages to deform the directivity pattern of said antenna apparatus, thereby increasing the resultant level of the direct wave and the reflected waves and substantially maintaining the maximum value of said resultant level.

4,074,267
DEVICE FOR NUMERICALLY DISPLAYING VOR BEARING

Sidney G. Knox, Oxnard, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 17, 1976, Ser. No. 686,976

Int. Cl.² G01S 1/50

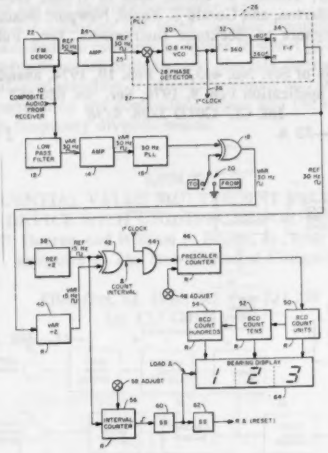
U.S. Cl. 343—106 R **12 Claims**

10. A device for numerically indicating bearing from a VOR bearing signal comprising:

a. means for detecting reference and variation signals from said VOR bearing signal;

b. means for frequency dividing said reference and variation signals;

c. an exclusive "OR" gate for comparing said reference and variation signals to produce a composite signal whenever



said reference and variation signals exist in opposing logic states; and

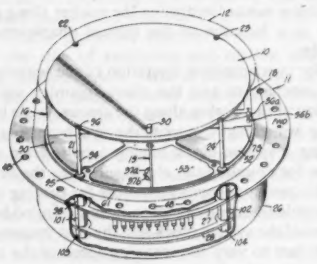
d. means for detecting duration of said composite signal to numerically indicate bearing.

4,074,268

ELECTRONICALLY SCANNED ANTENNA

Roy H. Olson, Palos Verdes, Calif., assignor to Hoffman Electronics Corporation, El Monte, Calif.

Filed June 21, 1976, Ser. No. 697,868
Int. Cl.[2] G01S 1/50
U.S. Cl. 343—106 R **19 Claims**



1. An antenna for electronically generating a rotating radiation pattern comprising

conic means for radiating electro-magnetic energy,

baseplate means forming a ground plane, said conic means forming a conic monopole and being mounted above said ground plane,

a plurality of modulator fin means disposed between said baseplate means and said conic means for altering the pattern of radiation radiated by said conic means, said modulator fin means including controllable variable resistance means electrically connected to said conic means, and

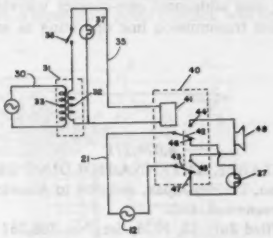
electrical circuit means coupled with said controllable variable resistive means for causing a predetermined out-of-phase change in the resistance of said variable resistive means of at least two of said modulator fin means.

4,074,269

BURGLAR ALARM FOR USE WITH AN AUTOMATIC GARAGE DOOR OPENER

Justin Hartley, 17 Fox Meadow Lane, West Hartford, Conn. 06107

Filed June 16, 1976, Ser. No. 696,754
Int. Cl.[2] H04B 7/00
U.S. Cl. 343—225 **9 Claims**



1. A burglar alarm for use in combination with an automatic garage door opener comprising:

a housing,

an alarm generator within the housing.

means for energizing the alarm generator whereby the alarm generator is capable of being activated by a signal from the automatic garage door opener, and

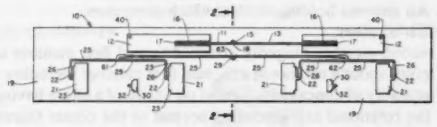
means for communicating the signal from the automatic garage door opener to activate the energized alarm generator.

4,074,270

MULTIPLE FREQUENCY MICROSTRIP ANTENNA ASSEMBLY

Cyril M. Kaloi, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 9, 1976, Ser. No. 712,994
Int. Cl.[2] H01Q 1/38
U.S. Cl. 343—700 MS **24 Claims**



1. A multiple electric microstrip antenna assembly, comprising:

a. a plurality of different electric microstrip antenna systems operating at different frequencies;

b. each of said microstrip antenna systems comprising at least one thin electrically conducting radiation element; each said radiation element being fed at a single feedpoint and being spaced apart from a thin ground plane conductor by a dielectric substrate;

c. each of said microstrip antenna systems sharing a common thin ground plane conductor and dielectric substrate;

d. at least one of said microstrip antenna systems having a plurality of radiation elements in array with a 90° phase difference between any interconnecting elements and groups of elements sharing a common junction for providing increased bandwidth and ease in tuning;

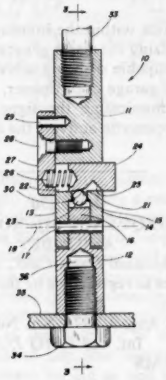
e. at least one tuning means included within the microstrip antenna substrate beneath each of the elements of at least one of said microstrip antenna systems for fine tuning of the antenna elements and operating to change the resonant frequency, the resonant input impedance and the effective length of said radiating elements;

f. said 90° phase difference being provided between two interconnecting elements sharing a common junction in any of said plurality of microstrip antenna systems by means of the length of a first transmission line between said common junction and the feedpoint to one of said two interconnecting elements being one-quarter wavelength longer than a second transmission line between said common junction and the feedpoint to the other of said two elements; said additional one-quarter wavelength length of said first transmission line operating as an impedance inverter.

4,074,271
ADJUSTABLE ANTENNA HOLDING DEVICE

Kotoku Sakuma, Toride, Japan, assignor to American Electronics, Inc., Greenwood, Ind.

Filed July 23, 1976, Ser. No. 708,261
Claims priority, application Japan, Jan. 31, 1976, 51-10490[U]
Int. Cl.² H01Q *1/08*
U.S. Cl. 343—882 **22 Claims**

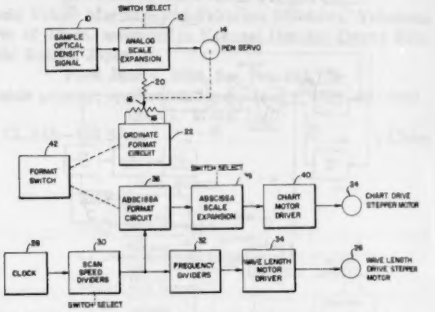


1. An antenna holding device which comprises:
a first member;
a second member hingedly attached to said first member to pivot about a rotational axis, said first member including a plurality of concavities formed on an arc of a circle having the rotational axis extending normal to the center therof, said second member including a first channel opening adjacent one of the concavities of said first member, and a second channel communicating with and extending other than parallel to the first channel;
a locking assembly including a locking member received within the first channel of said second member and movable therethrough to extend within one of the concavities of said first member, and further including a release member received within the second channel of said second member and abutting the locking member, said locking assembly having a locking condition in which the release member is in a first position and the locking member projects into one of the concavities of said first member, and a release condition in which the release member is in a second position and the locking member is withdrawn from the concavity of said first member to permit rotation of said second member relative said first member about the rotation axis;
said release member being movable in a direction between said first position and said second position; and
said direction being substantially parallel to said rotational axis.

4,074,272
SPECTROPHOTOMETER HAVING INDEPENDENTLY CONTROLLED CHART SCALE EXPANSION AND CHART FORMAT SELECTION

Allan S. Way; Thomas J. Glenn, both of Irvine; Howard J. Sloane, Fullerton, and Gerald T. Keahl, Newport Beach, all of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 443,631, Feb. 19, 1974, abandoned.
This application Feb. 9, 1976, Ser. No. 656,463
Int. Cl.² G01D *5/26, 9/38*
U.S. Cl. 346—33 A **2 Claims**



1. A spectrophotometer for measuring and recording an optical characteristic of a sample positioned in a radiant energy beam path comprising:
a first frequency responsive drive motor for driving a wavelength scanning mechanism in the radiant energy beam path to vary the wavelength output of the mechanism;
a chart recorder including a marker for recording on chart paper the optical characteristic of the sample as a function of the wavelength output of the mechanism to record a wavelength spectrum plot of the sample;
a second frequency responsive drive motor for driving the chart paper along an abscissa scale;
a third drive motor for driving the marker along an ordinate scale as a function of the optical characteristic of the sample;
means for synchronizing operation of the wavelength scanning mechanism and the chart recorder such that the position of the marker along the abscissa scale is a function of the wavelength output, the synchronizing means including a system clock having a pulse train output and means for coupling the clock output to the first and second frequency responsive motors for driving the same;
first variable frequency division means coupled between the output of the system clock and the first frequency responsive motor to vary the scanning speed of the wavelength scanning mechanism;
second variable frequency division means coupled between the system clock and the second frequency responsive motor for selecting one of several speeds at which the chart paper is driven relative to the marker along the abscissa scale and hence for selecting an abscissa scale expansion value;
third frequency division means independent of the second frequency division means and coupled between the system clock and the second frequency responsive motor, the third frequency division means having a plurality of preset operating conditions each establishing a different limit for the abscissa scale to define an abscissa scale format for the spectrophototmeter;
means for controlling the third drive motor and responsive to a signal indicative of the optical characteristic for establishing a predetermined fraction of the total range of optical characteristic values for recording over the entire

ordinate scale to define a condition of ordinate scale expansion for the spectrophotometer;

means independent of the controlling means for establishing preselected maximum limits on travel of the marker along the ordinate scale to define different ordinate scale formats for the spectrophotometer; and

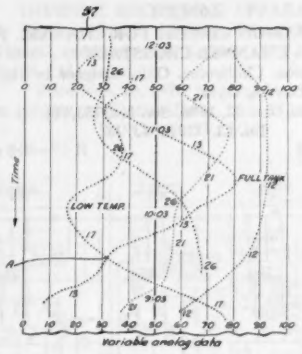
means for actuating the third variable frequency division means and the establishing means to select predetermined combinations of ordinate and abscissa formats independent from selection of values of ordinate and abscissa scale expansion by the controlling means and the second variable frequency division means.

4,074,273

SEQUENTIAL VALUE MULTI-POINT RECORDING DEVICE WITH UNIDIRECTIONAL SCAN

Wayne P. Dupree, and William F. Brown, Jr., both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 12, 1976, Ser. No. 731,239
Int. Cl.[2] G01D *9/38*
U.S. Cl. 346—34 **23 Claims**



1. In a process for recording variable analog data representative of physical parameters on a sheet material with a recording head which is moveable relative to said sheet material, comprising the step of retrieving and storing said variable analog data, tabulating said variable analog data in order of value, and marking said tabulated analog data on said sheet material, the improvement comprising the steps of driving said recording head in a unidirectional movement and in a continuous sweep over the sheet material, sequentially marking, as a function of time, said tabulated data at their value and representative of said physical parameters and in their order of magnitude on said sheet material, and continuously moving said sheet material, as a function of time, in a transverse direction relative to said recording head.

4,074,274

MULTIPOINT RECORDER

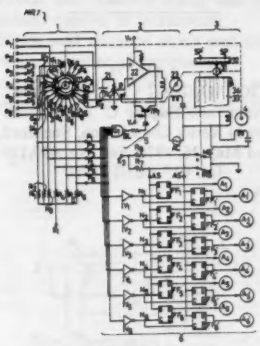
Hisaya Fujita; Nobuo Kaieda; Setsuo Sato, and Kenji Kawakami, all of Musashino, Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan

Filed July 22, 1976, Ser. No. 707,819
Claims priority, application Japan, July 31, 1975, 50-93506
Int. Cl.[2] G01D *9/00;* **H01H** *19/58*
U.S. Cl. 346—34 **11 Claims**

1. In a multipoint recorder of the type including a selection mechanism having a plurality of fixed measuring point contacts and a plurality of moving contacts for sequentially selecting signals from a plurality of measuring points, a self-balancing circuit including a balancing motor for intermittently measuring said signals, and an indicating and recording mechanism operated in synchronism with the selection mechanism for indicating and recording the measurements supplied from the self-balancing circuit, the improvement including:

a plurality of fixed auxiliary contacts positioned with said fixed measuring contacts in an alternating pattern such that each fixed auxiliary contact is positioned between an adjacent pair of said measuring contacts;

said measuring and switching contacts being configured in such a manner that one of said movable contacts, upon moving from a first fixed measuring point contact to a second fixed measuring point contact, will simultaneously



contact said first measuring point contact and the next adjacent auxiliary contact, and subsequently simultaneously contact said next auxiliary contact and said second measuring contact; and

means in circuit with said fixed auxiliary contacts for locking said balancing motor while said movable contact is in contact with said auxiliary contacts,

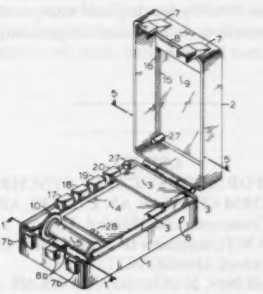
whereby said balancing motor is automatically locked while said movable contact switches from one said measuring contact to another.

4,074,275

STRIP CHART RECORDER

John C. Stires, III, Box 988, Rancho Santa Fe, Calif. 92067

Filed Feb. 4, 1977, Ser. No. 765,600
Int. Cl.[2] G01D *9/12*
U.S. Cl. 346—19 **3 Claims**



1. A case having a top with a door having a self-locking mechanism, a container in said case for holding a strip chart, a drive means in said case for advancing said chart, the drive means capable of being programmed for specific rates of movement versus time, a battery circuit for powering said drive means, a means for selecting the rate of chart movement, a transducer for sensing an environmental variable, a means for printing or writing the output from the transducer on said strip chart, a switch means for closing the battery circuit only when

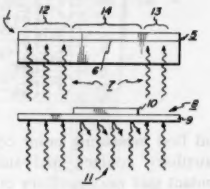
the door in the top of the case is closed, the case having a surface over which the chart moves, said surface having an identifying number or symbol which can be reproduced on the strip chart by applying pressure to that portion of the strip chart over said symbol or number, said strip chart having graphic means of identifying the time intervals recorded as they are related to the time interval programmed, said chart having several points to be marked for identifying which specific time interval has been selected.

4,074,276

MAGNETIC IMAGING SYSTEM USING HEAT

Werner E. L. Haas, and Eugene C. Faucz, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 26, 1976, Ser. No. 690,129
Int. Cl.[2] G03G *19/00*
U.S. Cl. 346—74.1 **16 Claims**



1. A magnetic imaging process, comprising: providing a magnetizable recording member comprising a substrate overcoated with a magnetic recording layer of magnetic particles dispersed in a binder; and exposing one of said substrate and said magnetic recording layer to light, thereby leaving said unexposed regions of said magnetic recording layer in said image configuration on the substrate in two locations at an energy level at about 0.05 to about 0.5 Joules per centimeter square for a period of time effective to at least weaken the binding force between said binder and said substrate to at least allow removal of said magnetic recording layer in regions thereof corresponding to exposed regions of said recording member upon contact of said magnetic recording layer with an adhesive member, thereby leaving said unexposed regions of said magnetic recording layer in said image configuration on the substrate in two locations.

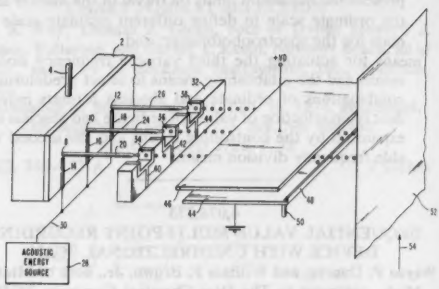
4,074,277

APPARATUS FOR ACOUSTICALLY SYNCHRONIZING DROP FORMATION IN AN INK JET ARRAY

Ramon Lane, Crompond, and Howard Hyman Taub, Mount Kisco, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 3, 1976, Ser. No. 738,423
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—75 **8 Claims**

1. In an ink jet system, the combination comprising:
an ink source;
means for emitting a plurality of streams of ink from said source;
a plurality of acoustic fibers, with a different one of said plurality of acoustic fibers being coupled to each of said plurality of streams at a position displaced from where each of said plurality of streams is emitted from said source; and
means for acoustically energizing each of said plurality of fibers for acoustically exciting each of said plurality of



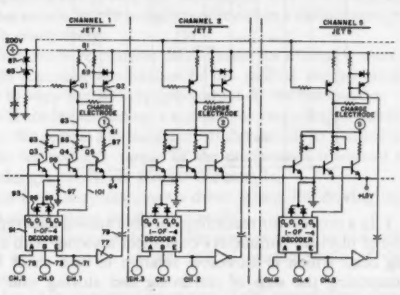
streams for synchronizing the droplet formation from one stream to the next.

4,074,278

COMPENSATION CIRCUIT FOR CHANNEL TO CHANNEL CROSSTALK

John A. Robertson, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Dec. 22, 1976, Ser. No. 753,614
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—75 **7 Claims**



1. A circuit for applying a potential to a charge electrode in an ink jet printer having multiple jets, to compensate for the charging effect of adjacent electrodes, comprising:
means for applying a catch potential or a print potential to the electrode for catch or print operations, respectively,
means for altering the print potential applied to the electrode when one of two adjacent electrodes is supplied with a catch potential, and
means for altering the print potential applied to the electrode when both of the adjacent electrodes are supplied with a catch potential, such that the charging effect of adjacent electrodes is compensated.

4,074,279

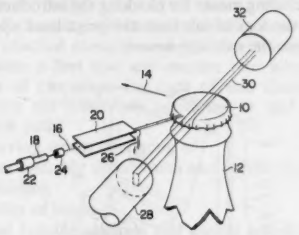
INK DROP WRITING APPARATUS

Takatoshi Ikeda, and Yoshio Ohuchi, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 15, 1976, Ser. No. 723,609
Claims priority, application Japan, Sept. 19, 1975, 50-112597
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—75 **10 Claims**

1. In an ink drop writing apparatus for writing information on a writing medium by selectively deflecting a stream of charged ink drops into said writing medium, the improvement comprising detection means for detecting the position of the writing medium in the deflecting direction of the stream of

charged ink drops, and deflection control means for increasing and decreasing the amount of deflection of said stream of charged ink drops in accordance with the position detected by



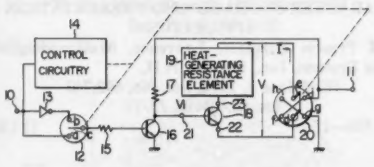
said detection means, whereby the ink drops can be printed at predetermined positions on the writing medium even when the position of the writing medium varies in the deflecting direction.

4,074,280

THERMAL RECORDING APPARATUS

Yasuyuki Kojima, Hitachi; Kiyohiko Tanno, Katsuta; Tetsuo Doi, Hitachi, and Kunio Ono, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 10, 1976, Ser. No. 740,680
Claims priority, application Japan, Nov. 15, 1975, 50-137633
Int. Cl.[2] G01D *15/10*
U.S. Cl. 346—76 R **7 Claims**



1. A thermal recording apparatus comprising:
a plurality of heat-generating resistance elements;
a driving circuitry adapted to supply drive current selectively to selected one(s) of said heat-generating resistance element(s) in response to signal representing information to be recorded;
a recording medium disposed in contact with said plurality of heat-generating resistance elements and adapted to be changed in color by said selected heat-generating resistance element(s);
means for moving said plurality of heat-generating resistance elements and said recording medium relative to each other; and
switching circuit means for inverting the direction of said drive current supplid to said selected heat-generating resistance element(s) in a predetermined manner.

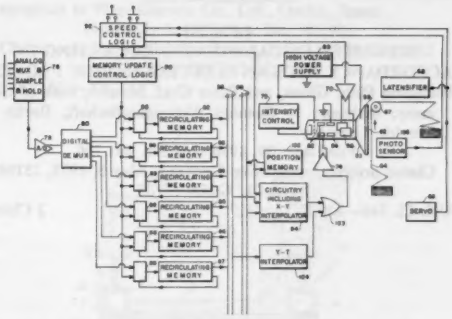
4,074,281

METHOD AND APPARTUS FOR MAKING HARD COPY RECORDS OF CURVES INCLUDING CURVES WHICH ARE MATHEMATICALLY DESCRIBED AS MULTI-FUNCTIONS FROM PERIODICALLY SAMPLED DATA POINTS

William T. Quarton, Englewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 26, 1976, Ser. No. 717,996
Int. Cl.[2] G06G *7/30*
U.S. Cl. 346—110 R **6 Claims**

1. Apparatus for making a hard copy record on a recording medium from a series of data points with a line scan recorder which records an area on the recording medium in a predetermined number of line scans, comprising in combination:
means for recording in a region on said medium with parallel line scans along one of two intersecting axes, a region between two adjacent line scan positions defining a finite band;
means for determining the distance between two data points along the one of said two intersecting axes;
means for determining the distance between said two data points along the other of said two axes;
means to divide said distance along said one axis into a predetermined number of increments;
means to divide said distance along said other axis into a predetermined number of increments;
means for determining the position of said medium relative to said recording means along said one axis;



means including said dividing means for determining interpolated values along said one axis between said data points;
means including said dividing means for determining interpolated values along said other axis between said data points;
means for determining the interpolated values along said one axis falling within said finite band;
means for determining the interpolated values along said other axis corresponding with the interpolated values along said one axis that are within said finite band; and
means responsive to said means for determining interpolated values along said other axis within said finite band for recording along said other axis a line whose length is a function of the interpolated values along said one axis falling within said finite band.

4,074,282

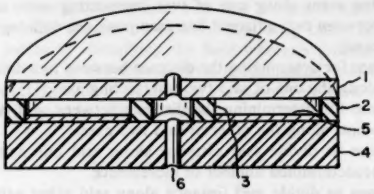
RADIATION-SENSITIVE RECORD WITH PROTECTED SENSITIVE SURFACE

Charles Balas, Jr., Spring Valley; David Yuan Kong Lou, Ossining, both of N.Y., and George Churchill Kenney, II, Stamford, Conn., assignors to North American Philips Corporation, New York, N.Y.

Filed May 13, 1976, Ser. No. 687,084
Int. Cl.[2] G01D *15/32*
U.S. Cl. 346—135 **19 Claims**

1. A radiation-sensitive record comprising a first disc-shaped member, a second disc-shaped member in coaxial confronted relationship with said first disc-shaped member and spaced therefrom, a pair of coaxial sealing rings of different sizes sealed between the confronting surfaces of said first and sec-

ond disc-shaped members coaxially therewith and forming an annular space therebetween, at least one of said disc-shaped



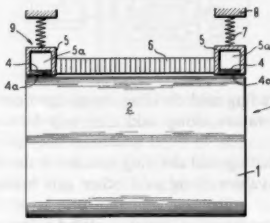
members being transparent, and a radiation-sensitive recording layer on one of said confronting disc surfaces.

4,074,283

NON-MECHANICAL PRINTER OPERATING IN ACCORDANCE WITH AN ELECTROGRAPHIC PROCESS

Wolfgang Fink, Glonn, and Peter Graf, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 29, 1976, Ser. No. 681,726
Claims priority, application Germany, May 5, 1975, 2519997
Int. Cl.[2] G01D *15/06*
U.S. Cl. 346—139 C **2 Claims**



1. A non-mechanical printer for use in an electrographic process comprising a horizontally disposed rotatable drum-shaped data carrier, an elongated horizontally disposed electrode comb located above said data carrier, and gas bearing means on said recording head for maintaining said recording head in predetermined spaced relation to said data carrier, said gas bearing means comprising a pair of housings connected respectively to the ends of said recording head and in overlying relation to said data carrier, said housings each having a pressurized gas inlet, a gas chamber and a porous bottom wall in registry with said data carrier and shaped to the contour thereof.

4,074,284

INK SUPPLY SYSTEM AND PRINT HEAD

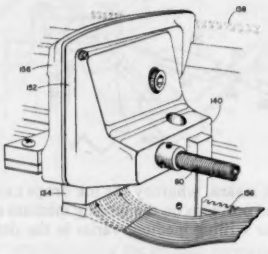
John L. Dexter, Mountain View; Edmond L. Kyser, Portola Valley; Charles S. Mitchell, Palo Alto, and Stephan B. Sears, Portola Valley, all of Calif., assignors to Silonics, Inc., Sunnyvale, Calif.

Filed June 7, 1976, Ser. No. 694,064
Int. Cl.[2] G01D *15/16*
U.S. Cl. 346—140 R **7 Claims**

1. An improved ink jet printer of the type having an ink supply, an asynchronous, volume displacement droplet ejection print head in fluid communication with the ink supply, the print head having at least one droplet ejecting nozzle and carriage means for effecting relative movement between the print head and a print receiving medium, wherein the improvement comprises:

first means for removably attaching the print head to the carriage means, including means for adjustably spacing the print head from the print receiving medium,

second means integral with the first means for removably connecting the print head to the ink supply, the second means including means for blocking the introduction of air into and the loss of ink from the print head upon its removal from the carriage means,



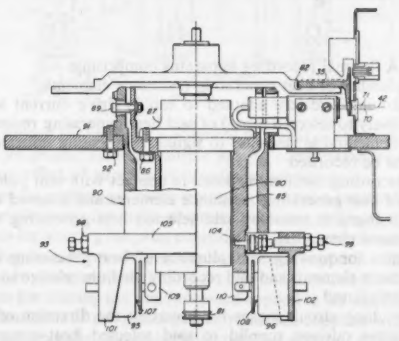
third means integral with the first and second means for providing a removable electrical interconnection with the print head, and wherein each print head includes preadjusted electrical signal conditioning means for adapating each print head to operate within predetermined system parameters when supplied with predetermined electrical signals through the third means.

4,074,285

PHOTOCOMPOSING MACHINE WITH MOVABLE CHARACTER STORAGE AND PRESENTATION APPARATUS

Raymond Francis Belanger, Lawrence, Mass., assignor to Graphic Systems, Inc., Hudson, N.H.

Filed June 4, 1976, Ser. No. 692,743
Int. Cl.[2] B41B *15/16*
U.S. Cl. 354—15 **11 Claims**



1. A character storage and retrieval apparatus for use in a phototypesetting machine or the like, for storing characters for selective presentation at a character display location, comprising,

a plurality of interchangeable discrete character carriers each said character carrier carrying a plurality of characters from one or more fonts arranged in rows along said character carriers permanently secured thereto and movably disposed for rotation in a closed path of motion along said rows when said photo-type setting machine is in operation, each of said carriers being dimensionally rigid in said closed path of motion, and said characters being selectively positionable in an unobstructed optical path within the boundaries of the dimensionally rigid carrier;

carrier mounting means;

releasable means for attaching each of said character carriers to said carrier mounting means, whereby said character storage apparatus is capable of carrying desired combinations of individually replaceable and dimensionally stable character fonts;

means for moving said carrier mounting means with each of said attached carriers across the direction of rotation and between a first row and another row whereby selected rows of characters for each of said discrete character carriers are selectively positioned in said unobstructed optical path,

said moving means consisting of

a gimbal assembly upon which said carrier mounting means is attached;

a plurality of bearings,

a gimbal housing wherein said gimbal assembly is attached to said gimbal housing by said bearings,

a plurality of solenoids,

a yoke assembly to which solenoids are mounted, said yoke assembly being attached to said gimbal housing whereby upon actuation of said solenoids, said gimbal assembly is positioned so that the character row can be aligned in said unobstructed optical path.

4,074,286
AUTOMATIC EXPOSURE CONTROL DEVICE FOR A CAMERA INCLUDING AUTOMATIC FILM SPEED SETTING MEANS

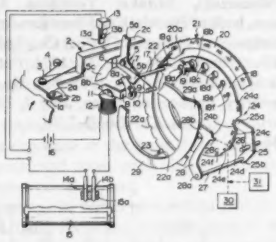
Ryotaro Suzuki, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Oct. 28, 1976, Ser. No. 736,588

Claims priority, application Japan, Oct. 28, 1975, 50-129515; Oct. 28, 1975, 50-129516; Sept. 7, 1976, 50-107004

Int. Cl.² G03B 7/00

U.S. Cl. 354—21 **24 Claims**



1. An automatic exposure control device for a camera provided with an automatic exposure control means including a photodetector to measure scene brightness and an exposure factor control means which controls an exposure factor such as shutter speed or diaphragm aperture in accordance with the scene brightness measured by said photodetector with reference to the film speed of a film loaded in the camera and further provided with a flash-matic means including a calculating means which gives an output to control the size of a diaphragm aperture taking into account such factors as the film speed of the film loaded in the camera, the distance of the object to be photographed and the guide number of flash light means used for illuminating the object to be photographed, said camera being adapted to be used with at least two kinds of film magazines, one being loaded with a film of special film speed and being provided with a conductor on an external surface thereof and the other being loaded with a film of normal film speed and not being provided with a conductor, wherein the improvement comprises:

a first switching means which is closed by said conductor on the film magazine loaded with a film of the special film speed,

a second switching means connected in series with the first switching means and opened in response to opening movement of a back cover of the camera,

an electromagnet connected with a power source in series with said first and second switching means so as to be energized when both the switching means are closed, and

a film speed setting means which is connected with said flash-matic means to give thereto a factor of film speed, and carries at least two light control apertures of different sizes selectively brought into alignment with said photodetector,

said film speed setting means being put into a state to set said special film speed in the flash-matic means when said electromagnet is energized.

4,074,287
FLASH AND CAMERA DEVICE

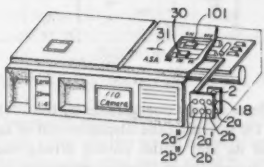
Hiroshi Iwata, and Tetsuo Yamaoka, both of Osaka, Japan, assignors to West Electric Co., Ltd., Osaka, Japan

Filed July 1, 1976, Ser. No. 701,981

Claims priority, application Japan, July 7, 1975, 50-83813

Int. Cl.² G03B 7/08, 7/18

U.S. Cl. 354—31 **11 Claims**



7. A flash and camera device comprising:

an automatic exposure camera including a first light sensor for sensing the brightness of an object, a first control circuit operated in response to the output of said first light sensor, and means for controlling the exposure of said camera by said first control circuit;

an electronic flash device including firing means for emitting a predetermined amount of light toward said object, a second light sensor for sensing light reflected by said object as a result of light transmitted thereto by said electronic flash device, a second control circuit operated in response to the output of said second light sensor and stop means responsive to said second control circuit for causing the generation of light by said firing means to stop in the course of said generation;

operation threshold adjusting means for changing the operation thresholds of said first and second control circuit in a linked manner; and

selection means for switching said operation threshold adjusting means in association with the exposure of said automatic exposure camera or the amount of the light emitted by said electronic flash device.

4,074,288
TIME DELAY QUENCH STROBE WITH IMPROVED FILL-IN FLASH PERFORMANCE

Bruce K. Johnson, Andover, and George D. Whiteside, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 674,840, April 8, 1976. This application May 10, 1976, Ser. No. 684,902

Int. Cl.² G03B 7/16

U.S. Cl. 354—33 **14 Claims**

1. A photographic camera apparatus comprising:

a housing;

means for mounting an objective lens on said housing;

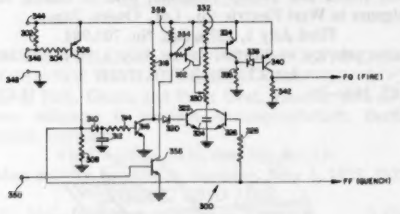
means associated with said housing for receiving a source of electrical energy;

a source of artificial illumination;

means within said housing for defining a film exposure plane;

a blade assembly mounted and arranged within said housing for displacement from an initial closed arrangement wherein said blade assembly precludes scene light from impinging on said exposure plane to a second arrangement wherein said blade assembly defines a maximum aperture through which scene light is permitted to impinge on said exposure plane and then to a final closed arrangement wherein said blade assembly again precludes scene light from impinging on said exposure plane, such a displacement of said blade assembly serving to define an exposure interval during which scene light is incident upon said film exposure plane;

scene light detecting means energizable by the source of electrical energy for providing an output signal in correspondence to the amount of scene light detected; and



means, at least in part energizable by the source of electrical energy, for initiating the displacement of said blade assembly from its said initial closed arrangement towards its second arrangement thereby commencing the exposure interval and for initiating the energization of the source of artificial illumination to effect the firing thereof subsequent to the initiating of the exposure interval, and then, responsive to said output signal of said scene light detecting means reaching a predetermined value indicative of a select film exposure value for effecting the displacement of said blade assembly into its said final closed arrangement and for initiating the deenergization of the source of artificial illumination to effect the termination of the firing thereof subsequent to the expiration of a select time delay, said last stated means further including means for varying said select time delay as a function of a varying characteristic of said output signal of said scene light detecting means prior to or simultaneous with the firing of said source of artificial illumination.

4,074,289

CAMERA EXPOSURE CONTROL SYSTEM ADAPTER TO ADJUST BOTH THE DIAPHRAGM AND THE SHUTTER

Tsukumo Nobusawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

Filed July 14, 1975, Ser. No. 595,805

Claims priority, application Japan, July 17, 1974, 49-81211; Aug. 2, 1974, 49-88099; Oct. 3, 1974, 49-114014; Nov. 5, 1974, 49-126557

Int. Cl.[2] G03D *7/08*

U.S. Cl. 354—23 D **23 Claims**

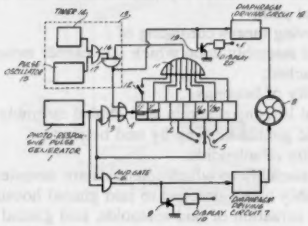
1. In a camera having a shutter operated in an automatic manner for controlling exposure time, and having a diaphragm with an adjustable opening; a camera exposure control system for automatically changing the setting of the diaphragm opening from a manual presetting thereof, which comprises:

a photo-responsive pulse generator means for producing in serial-by-bit format a number of data pulses as a function of the light intensity of the object to be photographed and the manual presetting of the diaphragm opening;

register means for storing in parallel-by-bit format, a digital signal to identify one of a sequence of register means memory states;

means responsive to the serially produced data pulses for sequencing the register means through its memory states so that a first predetermined number of said data pulses are required to sequence the register means to a first predetermined one of said memory states and a second, larger predetermined number of said data pulses are required to sequence the register means to a second predetermined one of said memory states;

diaphragm driving circuit means, including an electromechanical element, for adjusting the diaphragm opening in response to a drive control signal supplied thereto; and



drive control signal supplying means responsive to said digital signal for supplying the drive control signal to the diaphragm driving circuit means to cause it to adjust the diaphragm opening to an extent dependent upon the difference between the number of said serially produced data pulses and one of said predetermined number of data pulses.

4,074,290

APPARATUS FOR SYNCHRONIZING AN ELECTRONIC FLASH WITH A CAMERA

Soichiro Matsuzaki, Mitaka; Yoshihisa Maitani; Kunio Shimoyama, both of Hachioji, and Isao Kondo, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

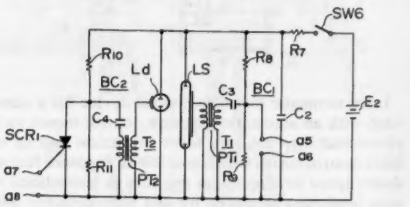
Division of Ser. No. 504,856, Sept. 11, 1974, Pat. No. 3,987,468.

This application Nov. 14, 1975, Ser. No. 631,935

Claims priority, application Japan, July 2, 1974, 49-75693

Int. Cl.[2] G03B *7/16*

U.S. Cl. 354—34 **4 Claims**



1. An apparatus for synchronizing an electronic flash with a camera having a focal plane shutter provided with first and second blinds, said apparatus comprising:

a normally disabled photometric circuit having switch means for enabling said circuit to initiate a photometric operation in synchronism with initiation of an opening movement of the shutter first blind to subsequently produce a shutter closing signal at a time delay controlled by the amount of time required for the photometric value to reach a given amount of exposure;

a shutter control circuit having a control input, said shutter control circuit preventing the remaining blind from running to thereby keep the shutter open in the absence of a shutter control signal at said control input and for enabling the remaining blind to run and thereby close the

shutter when a shutter closing signal is applied to said control input;

an electronic flash unit including means for initiating illumination thereof as soon as the first blind has completed running;

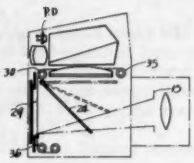
gate means for enabling the shutter closing signal to be coupled to the shutter control circuit only when the shutter first blind has moved to its fully open position;

means for interrupting the illumination of the electronic flash unit when the shutter closing signal is supplied from the photometric circuit as a result of photometry thereby a light reflected from an object being photographed, due to either natural light or flash light from the electronic flash unit or both.

4,074,291
SINGLE LENS REFLEX CAMERA WITH AUTOMATIC EXPOSURE CONTROL MECHANISM

Hiroshi Ueda, Nara, and Akira Yoshizaki, Osaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Japan

Filed June 24, 1976, Ser. No. 699,375
Claims priority, application Japan, July 7, 1975, 50-84811
Int. Cl.² G03B *7/08, 19/12*
U.S. Cl. 354—51 **5 Claims**



1. A single lens reflex camera comprising:

a mirror movable between a viewing position in which it projects into the optical path of the camera and a photographing position in which it is retracted from the optical path;

a focal plane shutter having first and second curtains which travel upon exposure in the same direction in which said mirror is retracted from said viewing position to said photographing position; and,

means for initiating the travel of said first curtain when said mirror is partially retracted from the optical path.

2. A single lens reflex camera having an automatic exposure control mechanism comprising:

a diaphragm aperture capable of being stopped down to a preset position;

means for initiating the stopping down operation of said diaphragm in response to a shutter release operation;

a mirror movable between a viewing position in which it projects into the optical path of the camera and a photographing position in which it is retracted from the optical path;

means for storing a signal indicative of light received through the lens of the camera after said diaphragm aperture has been stopped down;

means for driving said mirror from said viewing position to said photographing position after a signal has been stored in said storing means;

a focal plane shutter having first and second curtains which travel upon actuation of an exposure operation in the same direction in which said mirror is retracted from said viewing position to said photographing position;

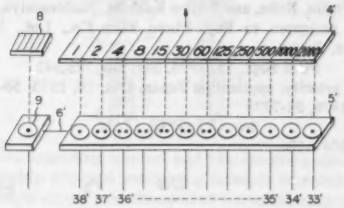
means for initiating movement of said first curtain for causing exposure when said mirror is partially retracted from the optical path during the movement from said viewing position to said photographing position; and,

means for controlling the delayed time for initiating movement of said second curtain in dependence upon the signal stored in said storing means.

4,074,292
SYSTEM FOR INDICATING PHOTOGRAPHIC INFORMATION

Soichi Nakamoto, Machida; Tadashi Ito; Fumio Ito, both of Yokohama, and Yasuo Isobe, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 437,621, Jan. 29, 1974, abandoned. This application Apr. 19, 1976, Ser. No. 678,033
Claims priority, application Japan, Feb. 6, 1973, 48-15014; Feb. 6, 1973, 48-15015
Int. Cl.² G03B *17/20, 7/00*
U.S. Cl. 354—53 **3 Claims**



1. A system for indicating shutter speeds of a camera comprising:

a plurality of segments each having a coded integer, which represents both a first shutter speed equal in seconds to the integer and a second shutter speed equal in seconds to the reciprocal of the integer;

a plurality of means each responsive to an indication signal for illuminating the coded integer of its associated one of said segments;

means for representing that the integer, when illuminated, is indicative of the associated first shutter speed; and

control circuitry including:

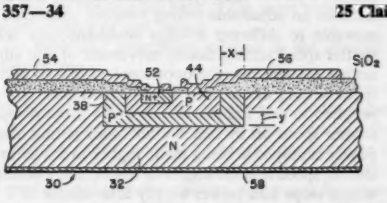
a plurality of means for producing the indication signals to activate said plurality of illuminating means, at least one of said plurality of illuminating means being activated selectively by two of said plurality of indication signal producing means; and

an additional circuit for activating said representing means, whereby the integer, when illuminated with said representing means, represents the associated first shutter speed, and, when illuminated without activating said representing means, represents the associated second shutter speed.

4,074,293
HIGH VOLTAGE PN JUNCTION AND SEMICONDUCTIVE DEVICES EMPLOYING SAME

Bernard L. Kravitz, Forest Hills, N.Y., assignor to Dionics, Inc., Westbury, N.Y.

Continuation-in-part of Ser. No. 175,124, Aug. 26, 1971, abandoned, and Ser. No. 259,763, June 5, 1972, abandoned. This application Nov. 15, 1973, Ser. No. 416,170
Int. Cl.² H01L *29/72*
U.S. Cl. 357—34 **25 Claims**



1. A PN junction extending to a major surface of a body of

semiconductive material in a diffused, planar semiconductive device of a first conductivity type comprising:

a first diffused zone of opposite conductivity type and forming said junction at its periphery;

a second diffused zone of opposite conductivity type entirely surrounded on said surface by said first zone;

said first zone having a concentration of opposite conductivity impurities of from two to four orders of magnitude less than said second zone and less than about 10^{16} atoms cc;

said body of semiconductive material containing less than about 10^{15} atoms/cc of first conductivity type impurities.

4,074,294

DATA RECORDING MEANS FOR PHOTOGRAPHIC CAMERA

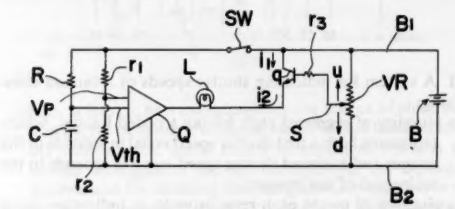
Susumu Fujita, Kobe, and Seijiro Kushibe, Nishinomiya, both of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sept. 15, 1976, Ser. No. 723,342

Claims priority, application Japan, Oct. 28, 1975, 50-130064; Jan. 26, 1976, 51-7375

Int. Cl.² G03B *17/24*

U.S. Cl. 354—106 **6 Claims**



1. In a data recording means employed in a camera to record data items on photgraphic film material located at an exposure station in said camera simultaneously with exposure of said film material to image-wise light reflected from an external scene upon actuation of a shutter means having associated therewith a shutter speed setting means externally actuable and movable to different settings to cause exposure action of said shutter means to be effected at different speeds and comprising a data carrier means movable by externally actuable means to bring successive items of data carried thereby to a projection position and a data projection system able to project the image of data items located at said projection position onto a specific portion of said film material and including a light source which with respect to said camera construction is located forward of said data carrier and which when actuated may illuminate data items located at said data projection position, said image of said data items being projectable by said projection system onto said film material only when said light source is actuated, and a light source actuation system for actuation of said light source during action of said camera shutter means, a data recording means wherein said light source actuation system comprises

a normally open power supply circuit which when closed supplies power to said light source, and includes a power source, a power supply adjustment circuit which at least includes an adjustable-setting element connected to, and movable to different settings simultaneously with, said shutter speed setting means, movement of said adjustable-setting element being proportional to that of said shutter speed setting means, and which causes said power to be supplied to said light source at a rate proportional to the shutter speed set by said shutter speed setting means, said power supply rate being made higher or lower as said set shutter speed is made higher or lower, and a timing circuit which stops said power supply after elapse of a set time from closure of said power supply circuit; and

a normally unactuated power supply circuit closure means which is actuated to close said power supply circuit during said exposure action effected by said shutter means.

4,074,295

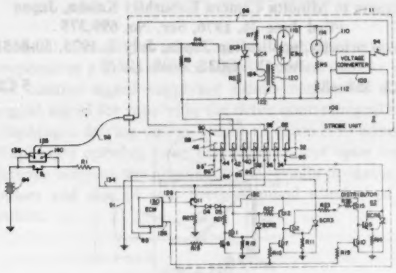
COMPACT ACCESSORY STROBE FOR CAMERAS WITH BATTERY ENCLOSED FILM PACK

Richard C. Kee, Chestnut Hill, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 23, 1976, Ser. No. 679,698

Int. Cl.² G03B *15/05*

U.S. Cl. 354—145 **9 Claims**



1. An electronic flash unit for use with a camera of the type having a flash socket assembly adapted for receipt of a conventional multiple flash bulb array together with an electrical receiving socket spaced apart from the flash socket for accommodating the connection of a conventional remote actuator button, said flash unit comprising:

a housing;

a storage capacitor;

means responsive to an applied, substantially steady stage, voltage for charging said capacitor;

circuit means responsive to an applied trigger signal for discharging said capacitor through said discharge tube to produce an illuminating flash of light;

a connector blade extending outward of said housing and adapted for receipt within the camera flash socket assembly, said connector blade having at least three spaced terminal elements thereon of which two terminal elements are arranged to receive an applied trigger signal from the camera and of which the third terminal element is arranged to receive one side of an applied, substantially steady state, voltage from the camera for charging said capacitor;

means for respectively electrically connecting said trigger signal receiving terminal elements to said means for discharging said capacitor and for electrically connecting said applied voltage receiving terminal element to said means for charging said capacitor;

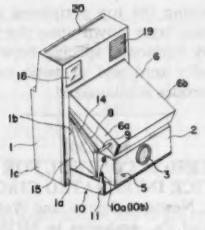
a flexible electrical connecting member having a single conductive element therein extending outward of said housing and connecting to an electrical insertion jack adapted for receipt within the camera receiving socket to receive the other side of the applied, substantially steady state, voltage from the camera for charging said capacitor; and

means within said housing for electrically connecting said conductive element to said means for charging said capacitor.

4,074,296
FOLDING CAMERA

Tsuneaki Munakata, Tokyo, and Makoto Kuboshima, Sagamihara, both of Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

Filed Dec. 27, 1976, Ser. No. 754,805
Claims priority, application Japan, Dec. 27, 1975, 50-157228
Int. Cl.[2] G03B *17/04*
U.S. Cl. 354—187 4 Claims



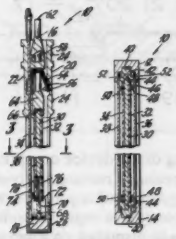
1. Folding camera comprising at least
an exposure compartment comprising opaque wall portions and defining an exposure station whereat film material may be exposed;
a lens mount carrying at least a taking lens assembly able to focus image-wise light reflected from an external scene onto said film material, and having a first support shaft affixed to a first rear corner portion thereof and a second support shaft affixed to a second rear corner portion thereof;
a front opening defined in a forward portion of said camera;
a case which has one end pivotally supported in one end portion of said front opening, may be accommodated in said front opening, and may be moved to a first position in which said case extends forwardly from said front opening and to a second position in which said case is accommodated in said front opening;
linkage assemblies which connect opposite sides of said case to opposite ends of said second support shaft;
pivotal support assemblies which are provided in connection to opposite sides of said lens mount and each of which comprises a long, generally rectangular support plate whose outer end is in pivotal attachment to a side portion of said lens mount, and a guide rod which has one end in pivotal attachment to the inner end of said support plate and whose opposite end is in pivotal attachment to a portion of a side wall of said camera which is near to the rear wall of said camera and which in terms of top-to-bottom dimension of said camera is in a generally central portion of said side wall;
wall portions defining slots through which said support plates and said guide rods may move or be accommodated; and
side-folding opaque bellows element provided between said exposure station and said lens mount.

4,074,297
DUPLEX CUT FILM HOLDER

Morris Hoffman, 19 Grand Ave., Farmingdale, N.Y. 11735

Continuation-in-part of Ser. No. 493,074, July 30, 1974, abandoned. This application Nov. 15, 1976, Ser. No. 741,931
Int. Cl.[2] G03B *17/26*
U.S. Cl. 354—285 4 Claims

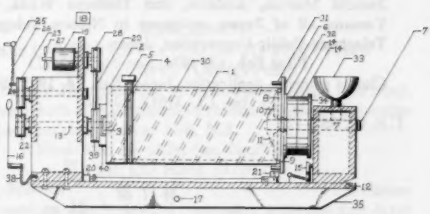
1. A photographic film sheet holder adapted for facilitated removable insertion therein of a sized photographic film sheet preparatory to photographic exposure of said film sheet, said holder comprising a pair of opposite side frames and an end frame cooperating to define a three-sided frame housing bounding a film-receiving compartment, a corresponding pair of opposite side frame inserts and an end frame insert having operative positions disposed in said three-sided frame housing, each of said inserts having film-holding lip extension means thereon projected into said film-receiving compartment about the periphery thereof for establishing holding contact with a film sheet inserted into said compartment, each of said lip extension means on each said opposite side insert having in the end adjacent said end insert a film-inserting slot formed therein of a selected length so as to facilitate the insertion of said film sheet therethrough into said compartment into an initial position of being slidably held beneath the length of said lip extension means extending beyond said film-inserting slot thereof, and a slidably disposed positioning member mounted in spanning relation across said three-sided frame housing open end movable from a clearance position through a film sheet positioning stroke into said compartment, whereby said positioning member establishes pushing contact against an end of said film sheet and urges same during said positioning stroke into an operative position in said compartment in which the peripheral edges of said film sheet are in engaged relation with said lip extension means of said opposite side and bottom inserts.



4,074,298
PHOTOGRAPHIC PROCESSING MACHINE

Neil B. Cartwright, 693 E. 16th St., Idaho Falls, Idaho 83401

Continuation of Ser. No. 436,459, Jan. 25, 1974, abandoned. This application June 30, 1975, Ser. No. 591,351
Int. Cl.[2] G03D *13/00*
U.S. C'. 354—299 2 Claims



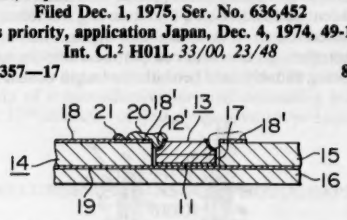
1. Apparatus for processing photographic sheet material, said apparatus comprising:
a tubular processing vessel having at least one open end,
means for rotatably supporting and rocking the tubular vessel,
means for mounting the sheet material in the interior of said vessel and for spacing the back of the sheet material from the inner surface of said vessel,
means for supplying processing solution to the interior of said vessel, and
means for discharging the used processing solution from the vessel, wherein said discharging means includes a movable lid for closing the open end of the vessel in a fluid tight manner, resilient means for exerting pressure on the lid to maintain it in the closed position, means for tilting the vessel for draining the solution, and means for removing the pressure exerted by the resilient means on the lid to thereby allow the solution to be drained from the vessel.

4,074,299

LIGHT-EMITTING DIODE ELEMENT AND DEVICE

Masaaki Kusano, Yokohama; Shinzi Okuhara, Fujisawa, and Ichiro Ohhinata, Yokohama, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 1, 1975, Ser. No. 636,452
Claims priority, application Japan, Dec. 4, 1974, 49-138382
Int. Cl.[2] H01L *33/00, 23/48*
U.S. Cl. 357—17 8 Claims



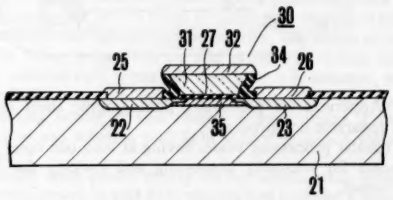
1. A light-emitting diode device comprising a light-emitting diode element comprising a rectangularly-shaped semiconductor wafer including a pair of a p-type semiconductor region and an n-type semiconductor region forming a pn junction, an inclined first electrode provided on a beveled area formed by removing a portion of at least one of the peripheral edges of the surface of one of said semiconductor regions in said semiconductor wafer, and a flat second electrode provided on the surface of the other said semiconductor region, and a substrate which comprises a rectangularly-shaped opening for receiving said light-emitting diode element therein, a first wiring conductor strip disposed to extend around the top end of said opening, and a second wiring conductor strip disposed to extend along the bottom end of said opening, said light-emitting diode element being received in said opening of said substrate in such a relation that said second electrode directly faces said second wiring conductor strip, and said first and second electrodes are electrically connected to said first and second wiring conductor strips respectively, said first electrode being electrically connected to said first wiring conductor strip by a bridge of low melting point metal.

4,074,300

INSULATED GATE TYPE FIELD EFFECT TRANSISTORS

Tetsushi Sakai, Tachikawa; Yutaka Sakakibara, Tokorozawa; Junichi Murota, Kodaira, and Tsutomu Wada, Higashi-Yamato, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Japan

Filed Feb. 13, 1976, Ser. No. 657,873
Claims priority, application Japan, Feb. 14, 1975, 50-17938
Int. Cl.[2] H01L *29/78*
U.S. Cl. 357—23 5 Claims



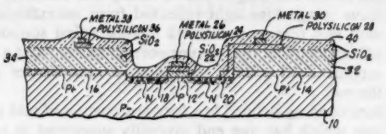
1. An insulated gate type field effect transistor comprising a semiconductor substrate; spaced-apart source and drain regions formed at one surface of said semiconductor substrate; a first insulating film overlying the surface of said substrate between said source and drain regions; a polycrystalline semiconductor gate layer disposed over said first insulating film and having a deliberately formed inverted frustum shape; the top surface of the inverted frustum being at a different level from the level of the source and drain regions and the outer peripheral edges of the projection of the top surface of the inverted frustum onto the substrate being substantially coextensive with the inner peripheral edges of the source and drain regions; source, drain and gate electrodes formed on said source region, said drain region and said polycrystalline semiconductor gate layer, respectively, and second insulating films formed over substantially the entire side surface of said polycrystalline semiconductor gate layer between said gate electrode and said source electrode and between said gate electrode and said drain electrode and extending to and covering the top surface areas of the substrate surrounding the gate layer, said last mentioned top surface areas being substantially defined by projecting the top peripheral surface of said inverted frustum gate layer down upon the top surface of the substrate whereby horizontal spacing between adjacent electrodes is essentially zero and parasitic capacitive coupling between the electrodes is minimized.

4,074,301

FIELD INVERSION CONTROL FOR N-CHANNEL DEVICE INTEGRATED CIRCUITS

John O. Paivinen, Newtown Square, and Walter D. Eisenhower, Audubon, both of Pa., assignors to MOS Technology, Inc., Norristown, Pa.

Division of Ser. No. 613,537, Sept. 15, 1975, Pat. No. 4,011,105.
This application Nov. 1, 1976, Ser. No. 737,547
Int. Cl.[2] H01L *29/78*
U.S. Cl. 357—23 8 Claims



1. An N-channel MOS integrated circuit structure comprising:

a single crystal semiconductor material substrate of P^--type bulk conductivity material having a laterally extending top flat surface;

said substrate being ion-implanted along said top surface with a P-type dopant to form a top, P^+-type field layer, the resistivity of said P^+-type field layer being substantially less than that of the underlying P^--type material;

selected portions of said P^+-type field layer being removed at locations which are laterally spaced from each other to leave a pattern of field layer areas, and the P^--type material which is exposed thereby and is laterally surrounded by said field areas being ion-implanted with a P-type dopant to form top, P-type layers, the resistivity of said P-type layers being intermediate that of the P^--type material and the material of the P^+-type field layer;

selected portions of at least some of said P-type layers being doped with N-type material to form N-channel MOS devices;

layers of material electrically inert as compared with said P^+-type material being disposed over the field areas; and

electrical interconnects extending over at least some of said layers of inert material and making electrical contact with at least some of said MOS devices.

4,074,302

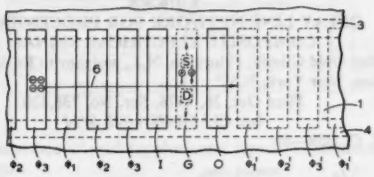
BULK CHANNEL CHARGE COUPLED SEMICONDUCTOR DEVICES

Robert J. Brewer, Carshalton, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 19, 1976, Ser. No. 688,008
Claims priority, application United Kingdom, June 26, 1975, 27093/75; Nov. 27, 1975, 48894/75
Int. Cl.[2] H01L *29/78, 29/04;* G11C *19/28*
U.S. Cl. 357—24 34 Claims

1. A semiconductor device comprising a semiconductor

body having a semiconductor layer of one conductivity type, means for enabling the semiconductor layer to be locally fully depleted without avalanche multiplication in order to allow the movement of majority charge carriers representative of information via the interior of the layer to one or more storage sites in the layer, means for enabling the reading of information present at least in one storage site comprising an insulated gate field effect transistor structure having its channel region present at the surface of the semiconductor layer above said one



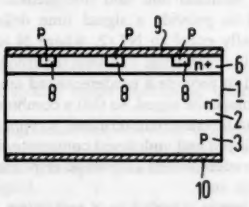
storage site and between source and drain regions of the opposite conductivity type, and means for enabling the temporary confinement of the quantity of majority charge carriers in said one storage site to the interior of the layer without mixing of the stored charge carriers in said one storage site and the mobile minority charge carriers in the transistor channel in order that the current flow in the transistor channel when the transistor gate electrode is maintained at ay given potential is dependent upon the quantity of charge in the said one storage site.

4,074,303

SEMICONDUCTOR RECTIFIER DEVICE

Hansjochen Benda, and Peter Huber, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 20, 1976, Ser. No. 650,626
Claims priority, application Germany, Feb. 13, 1975, 2506102
Int. Cl.² H01L *29/00*
U.S. Cl. 357—33 **3 Claims**



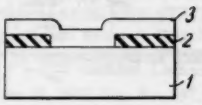
1. A semiconductor diode comprising an interior zone, a first exterior zone connected to the interior zone on one side and has the same conductivity type as said interior zone, said first exterior zone having a higher doping concentration than said interior zone, and with at least a second exterior zone connected to the other side of said interior zone, said second exterior zone being of opposite conductivity type of said interior zone, a first electrode mounted on said first exterior zone, a second electrode mounted on said second exterior zone, areas of opposite conductivity type formed in said first exterior zone and distributed across its surface, said areas having depths which are less than the depth of said first exterior zone, and said first electrode covering and in contact with said areas and said first exterior zone and said areas of opposite conductivity type having a doping concentration which is less than that of said first exterior zone and greater than that of said interior zone.

4,074,304

SEMICONDUCTOR DEVICE HAVING A MINIATURE JUNCTION AREA AND PROCESS FOR FABRICATING SAME

Hiroshi Shiba, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 618,419, Oct. 1, 1975, abandoned. This application Mar. 2, 1977, Ser. No. 773,658
Claims priority, application Japan, Oct. 4, 1974, 49-114408
Int. Cl.² H01L *29/04, 27/02, 29/34, 23/48*
U.S. Cl. 357—59 **9 Claims**



1. A semiconductor device comprising:

a semiconductor substrate having a first semiconductor region of one conductivity type and a second semiconductor region of the opposite conductivity type contained in said first semiconductor region with a p-n junction between said first and second semiconductor regions;

an insulating film on one main surface of said substrate and having an opening which exposes portions of the surface of said first semiconductor region and of the surface of said second semiconductor region;

a silicon thin film having a first segment covering said insulating film and a second segment in direct contact with the exposed surfaces of said first and second semiconductor regions, and a silicon oxide film produced by the selective oxidation of a portion of said silicon thin film and covering a portion of said p-n junction exposed in said opening of said insulating film;

portions of said first and second segments of said silicon thin film that are not selectively oxidized defining first and second electrode wiring paths which are mutually separated by said silicon oxide film, said first and second electrode wiring paths making ohmic contacts with said first and second semiconductor regions, respectively.

4,074,305

GaAs LAYERS AS CONTACTS TO THIN FILM SEMICONDUCTOR LAYERS

Wilbur Dexter Johnston, Jr., Holmdel, and Joseph Leo Shay, Marlboro, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 16, 1976, Ser. No. 742,519
Int. Cl.² H01L *23/48*
U.S. Cl. 357—67 **9 Claims**

9. A semiconductor device containing a p-type InP layer deposited on a conducting substrate, wherein the contact to the substrate is improved by a layer of p-type GaAs deposited between said substrate and said InP layer.

4,074,306

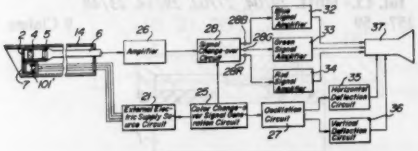
ENDOSCOPE UTILIZING COLOR TELEVISION AND FIBER OPTICS TECHNIQUES

Yoshikazu Kakinuma, Hachioji, and Tadashi Morokuma, Tokyo, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed July 23, 1976, Ser. No. 708,262
Int. Cl.² H04N *9/02*
U.S. Cl. 358—1 **8 Claims**

1. An endoscope for displaying a color picture image of an object to be viewed in a hollow cavity, comprising a sheath to be inserted into said hollow cavity and an exterior circuit arranged outside said sheath, said sheath including a self-scanning type solid state image pick-up device, a bundle of lead wires composed of a lead wire for supplying a signal for oper-

ating said image pick-up device from said exterior circuit and a lead wire for leading out a picture signal supplied from said image pick-up device toward said exterior circuit, and an illumination light transfer body comprised of flexible light-conducting fibers for transferring a light for illuminating said object to be viewed from said exterior circuit, said exterior circuit including a signal generator for operating said self-scanning type solid state image pick-up device, an amplifier for



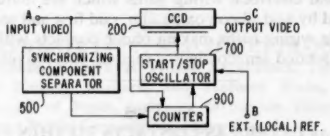
amplifying said picture signal supplied from said image pick-up device, a color picture tube for displaying a color picture image upon receipt of said picture image signal from said amplifier, a light source for emitting illumination light on said illumination light transfer body, means for decomposing light incident on said illumination flexible light-conducting fibers into three primary color lights and a signal change-over circuit for changing over a signal supplied to said picture tube by a synchronizing signal.

4,074,307

SIGNAL PROCESSOR USING CHARGE-COUPLED DEVICES

Robert Adams Dischert, Burlington; Robert Norman Hurst, Cherry Hill, and Arch Clinton Luther, Jr., Woodstown, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 14, 1975, Ser. No. 604,775
Int. Cl.[2] H04N 5/78
U.S. Cl. 358—8 **5 Claims**



1. A time base corrector for removing time base errors from video signal information of a type including synchronizing pulses, comprising:

storage means including a predetermined number of sequentially arranged storage elements and having an input terminal to be coupled to a source of signals representative of said video signal information to be corrected and an output terminal for providing corrected signals representative of said video signal information, said storage means responsive to clock pulses for transferring said signals through successive storage elements from said input terminal to said output terminal;

a start/stop oscillator coupled to said storage means to apply clock pulses thereto;

timing signal means responsive to an external source of synchronizing signal components coupled to said start/stop oscillator for providing a first reference signal for starting the operation of said oscillator to provide clock pulses to said storage means;

a triggerable counter which, after being triggered on, stops said oscillator after the number of clock pulses necessary to transfer a signal from said input terminal to the last of said sequentially arranged storage elements; and

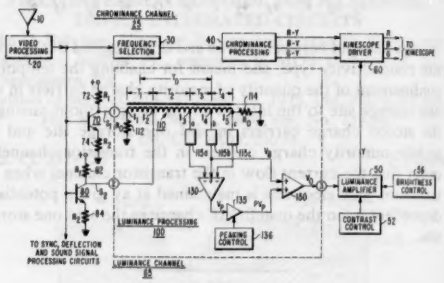
synchronizing pulse separator means coupled to receive said video signal to be corrected and to said counter for providing a second reference signal for starting said counter at a predetermined time during each active line period of said video signal, whereby the portion of said video signal occurring at said predetermined time is stored at the last of said sequentially arranged storage elements.

4,074,308

DELAY LINE NETWORK FOR PROCESSING A COMPOSITE ELECTRICAL SIGNAL

Walter Gold Gibson, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 28, 1976, Ser. No. 736,420
Int. Cl.[2] H04N 9/00, 5/14
U.S. Cl. 358—38 **18 Claims**



1. Apparatus for processing a composite electrical signal, comprising:

a source of composite electrical signal;

wide bandwidth signal delaying means having at least respective end terminals and an intermediate terminal;

first means for coupling said composite signal to one of said end terminals of said signal delaying means;

second means for coupling said composite signal to said intermediate terminal of said signal delaying means, said one end terminal and said intermediate terminal being arranged to provide a signal time delay therebetween substantially equal to NT/2, where N is an odd integer and T is the reciprocal of a selected frequency at which it is desired to provide a predetermined amplitude response of said composite signal, so that a combined signal appearing at said intermediate terminal is representative of relatively delayed and undelayed composite signals and exhibits said predetermined amplitude response at said selected frequency; and

utilization means coupled to a remaining one of said end terminals for translating said combined signal.

4,074,309

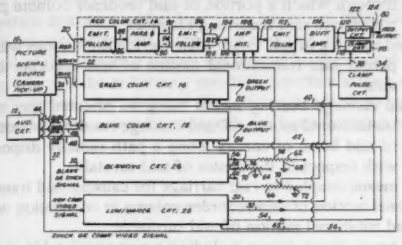
VIDEO EFFECTS APPARATUS AND METHOD

David Wynn-Smith, Borehamwood, England, assignor to Chroma-Flex, Inc., West Nyack, N.Y.

Filed Nov. 12, 1976, Ser. No. 741,360
Int. Cl.[2] H04N 9/535
U.S. Cl. 358—82 **29 Claims**

22. A method for providing special video effects by the use of color video signals and supplemental television signals, said method comprising forming at least one of said video signals into inverted and non-inverted signals, selecting a signal level

between the inverted and non-inverted signals, and amplitude mixing the thusly selected signal with a further signal derived

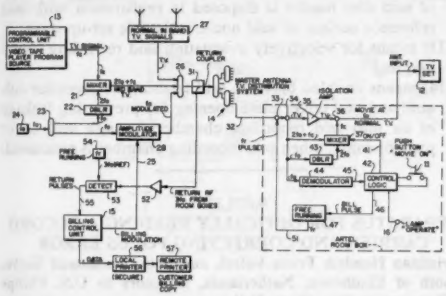


from at least one of said supplemental signals to produce an output signal.

4,074,310
SELECTIVE CCTV COMMUNICATING

Paul A. Hurney, Lexington, and John P. Curtis, Reading, both of Mass., assignors to Artel Manufacturing Corporation, Waltham, Mass.

Filed Nov. 26, 1975, Ser. No. 635,409
Int. Cl.² H04N *7/18*
U.S. Cl. 358—84 **4 Claims**

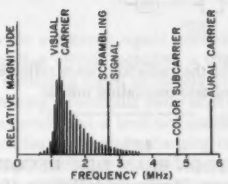


1. Selective communication apparatus comprising,
a source of a master oscillator signal of frequency f_o,
a source of a special signal modulated upon a carrier of frequency f_c,
signal processing means responsive to said master oscillator signal for providing a processed signal of predetermined frequency that is integrally related to that of said master oscillator signal,
mixing means responsive to said special signal and said processed signal for providing said special signal translated in frequency by an amount corresponding to the algebraic combination of said predetermined frequency and said frequency f_o,
a source of other signals in a frequency range embracing said frequency f_c outside the frequency range embracing the translated special signal,
means for combining said other signals, said translated special signal and a signal related to said master oscillator signal of said frequency f_o for providing a combined signal,
master distributing means for receiving said combined signal and providing it to a plurality of remote locations with each remote location having a remote unit and each remote unit comprising,
a remote unit output for coupling signals to a utilization device,
means for coupling all said other signals to said remote unit output,
means at said remote unit responsive to said translated special signal and said signal related to said master oscillator signal for selectively translating said special signal to the frequency range embracing said other signals for transmission to said remote unit output in response to a selection signal transmitted thereto over a path entirely at the location of said remote unit,
and means at said remote unit for providing said selection signal.

4,074,311
TELEVISION SECURITY SYSTEM

James L. Tanner, Reseda, and Bruno A. Rist, Northridge, both of Calif., assignors to Tanner Electronic Systems, Van Nuys, Calif.

Filed June 18, 1976, Ser. No. 697,507
Int. Cl.² H04N *1/44*
U.S. Cl. 358—118 **45 Claims**



27. A television security system comprising:
means for generating a television signal having a video carrier and an audio carrier;
scramble signal generating means for injecting at least one scramble signal between the video and audio carriers of said television signal, said at least one scramble signal having a frequency substantially between the limits of one-fourth and three-fourths of the frequency interval between said video carrier and said audio carrier, such that said television signal is scrambled thereby; and
transmitting means for transmitting said scrambled television signal for television reception.

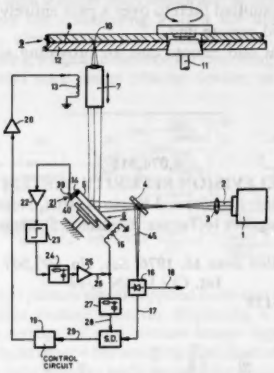
4,074,312
AUTOMATIC DITHERING OPTICAL FOCUSING SYSTEM USING AN OSCILLATING MIRROR IN THE PATH OF THE RADIATION BEAM

Gerard Eduard van Rosmalen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 1, 1976, Ser. No. 662,456
Claims priority, application Netherlands, Jan. 19, 1976, 7600479
Int. Cl.² G11B *11/00*
U.S. Cl. 358—128 **9 Claims**

1. An automatic focusing system for a disc player system comprising means for projecting a radiation beam onto a moving surface of a rotating disc that is optically encoded with information thereby modulating the radiation beam with said encoded information; radiation-sensitive means for converting the modulated beam from the disc into a focusing error signal and into an electrical output signal corresponding to said information; optical focusing means comprising lenses axially movable in the path of the radiation beam from the projecting means for focusing the radiation beam to a read spot in an imaginary focusing plane including said optically encoded moving surface of the disc in response to said focusing error signal; and an oscillating mirror in the path of the radiation beam from said projecting means between the projecting means and the disc and comprising a base having a reflecting

surface, and means for producing bending periodic oscillations in said reflecting surface, said oscillations having a component



in the direction of the radiation beam reflected from said reflecting surface of said oscillating mirror.

4,074,313

ELECTRON BEAM DISC RECORDER

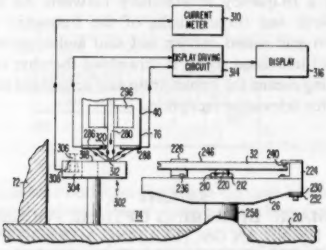
John Henry Reisner, Haddonfield; William Henry Morewood, Pennington, and George Herbert Needham Riddle, Princeton, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed June 30, 1976, Ser. No. 701,416

Claims priority, application United Kingdom, June 14, 1976, 24561/76

Int. Cl.[2] H04N *5/76*

U.S. Cl. 358—128 **7 Claims**



1. An apparatus for recording signals by directing a beam of energy toward a disc master; said beam of energy having characteristics representative of signals to be recorded; said disc master having characteristics responsive to said beam of energy; said apparatus comprising the combination of:

(1) a frame;

(2) a base plate secured to said frame;

(3) a non-translatable turntable;

(4) means secured to said base plate for rotatably supporting said non-translatable turntable;

(5) means coupled to said non-translatable turntable for causing rotational motion of said turntable;

(6) a cover plate mounted to said frame;

said cover plate defining a recording chamber, surrounding said turntable, in cooperation with said base plate;

(7) a carriage;

(8) bearing means secured to said cover plate for supporting a translational motion of said carriage relative to said cover plate;

(9) a translatable recorder column for providing a signal representative beam of energy;

said recorder column being secured to said carriage for translational motion therewith;

said carriage and said cover plate having openings through which a portion of said recorder column protrudes into said recording chamber;

said opening in said cover plate having dimensions which permit said translational motion of said recorder column;

said carriage bearing means being so oriented that said translational motion of said carriage results in a motion of said beam of energy along a path radially disposed with respect to the center of said turntable;

(10) means coupled to said carriage for causing said translational motion of said recorder column in correlation with said rotational motion of said turntable;

(11) beam set-up means including a non-translatable stage; said non-translatable set-up stage being fixedly mounted within said recording chamber adjacent the outside perimeter of said turntable; said non-translatable set-up stage having a reference surface which is responsive to said beam of energy; said translational motion causing means additionally serving to selectively position said translatable recorder column in alignment with said non-translatable set-up stage in order to permit directing of said beam of energy onto said reference surface of said non-translatable set-up stage for detecting pertinent characteristics of said beam of energy;

(12) means for releasably securing a disc master to said non-translatable turntable such that the recording surface of said disc master is disposed in registration with said reference surface of said non-translatable set-up stage;

(13) means for selectively evacuating said recording chamber; and

(14) means coupled between said translatable recorder column and said cover plate opening for preventing leakage of air into said recording chamber through said cover plate opening, when said recording chamber is evacuated.

4,074,314

APPARATUS FOR OPTICALLY READING A RECORD CARRIER AND CORRECTING FOCUS ERROR

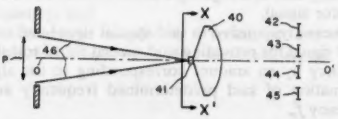
Christiaan Hendrik Frans Velzel, and Peter Ferdinand Greve, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 527,244, Nov. 26, 1974, Pat. No. 3,992,575. This application Aug. 27, 1976, Ser. No. 718,398

Claims priority, application Netherlands, Feb. 25, 1974, 7402504

Int. Cl.[2] H04N *5/76*; G11B *7/12*

U.S. Cl. 358—128 **1 Claim**



1. An apparatus for reading a record carrier on which information is stored in an optically readable structure, which apparatus includes a radiation source, an objective system for imaging the radiation source on the information structure of the record carrier, a radiation-sensitive detection sstem for converting the radiation which is supplied by the radiation source and modulated by the information structure into an electrical signal, said apparatus being provided with a focus error detection system, wherein the radiation source comprises at least two radiation sub-sources, which are offset relative to each other both in the direction of the optical axis of the objective system and in a direction transverse thereto, a separate detector in the detection system for each of the radiation subsources, a first element means for dividing a radiation beam

supplied by the radiation source into two separate sub-beams, a second element means for focussing the sub-beams in different planes, an optical assembly comprising an optical wedge and a field lens disposed in the path of the radiation passing said separate detectors, and at least three additional radiation-sensitive detectors disposed in the plane in which images of the exit pupil of the objective system are formed by the optical assembly, wherein the radiation - sensitive detection system detects small errors in focusing and the additional radiation - sensitive detectors derive correction signals for large focusing errors.

4,074,315

APPARATUS FOR REPRODUCING MULTIPLEX VIDEO DATA

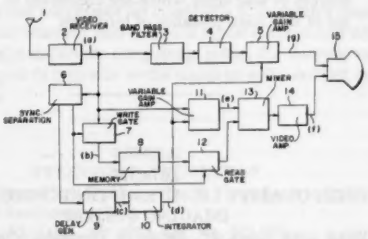
Hiroshi Kawamura; Yoshihisa Nishitani, and Katsumi Muta, all of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 27, 1976, Ser. No. 690,729

Claims priority, application Japan, June 6, 1975, 50-68196; Feb. 2, 1976, 51-10211; Feb. 2, 1976, 51-10212; Feb. 2, 1976, 51-10213

Int. Cl.² H04N *7/00*

U.S. Cl. 358—142 **5 Claims**



1. An apparatus for reproducing multiplex video data comprising:

receiver means for outputting composite video signals, said composite video signals including main video signals having a vertical blanking interval and symbol data multiplexed with the main video signals during the vertical blanking interval;

write-in gate means for selecting the symbol data from the composite video signals outputted by said receiver means;

memory means connected to said write-in gate means and responsive to to selecting of symbol data for recording the selected symbol data;

read-out gate means for reading out the symbol data recorded in said memory means; and

means for superposing the symbol data read out by said read-out gate means with the composite video signals outputted by said receiver means to produce a resultant signal for visual display, including means connected to said receiver means for controlling the amplitude of the main video signals in the composite video signals outputted by said receiver means and corresponding to the superposing background for the symbol data, and mixer means connected to said read-out gate means and said amplitude controlling means for multiplexing the symbol data read-out by said read-out gate means with the composite video signals having a main video signals amplitude controlled by said amplitude controlling means to produce a resultant signal for visual display.

4,074,316

ELECTRONIC SWITCHING SIGNAL GENERATOR FOR USE IN TELEVISION

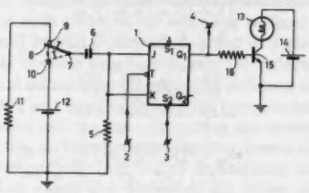
Robert Tiemeijer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 26, 1976, Ser. No. 708,600

Claims priority, application Netherlands, Apr. 8, 1975, 7509245

Int. Cl.² H04N *5/22*

U.S. Cl. 358—181 **5 Claims**



1. An electronic switching signal generator comprising a master slave flip-flop circuit including a trigger input means for receiving a switching signal occurring at a television field frequency and having a switching pulse edge occurring during field blanking intervals, and at least one condition input means; and a capacitor charging and discharging circuit coupled to said condition input means and including a monostable push-button switch, a voltage source coupled to said switch, a capacitor coupled to said switch and a pair of charge-discharge resistors coupled to said switch and said capacitor respectively.

4,074,317

MULTI-CHANNEL VIDEO DISPLAY APPARATUS USING SEQUENTIAL CIRCUIT

Hiroshi Kogo, Tokyo; Tokuji Kato, Chiba, and Takashi Uematsu, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Nov. 3, 1976, Ser. No. 738,575

Claims priority, application Japan, Nov. 5, 1975, 50-132113

Int. Cl.² H04N *5/22*

U.S. Cl. 358—181 **5 Claims**

1. Apparatus for displaying a plurality of channels of video information including vertical synchronization pulses on divided areas of the screen of a cathode ray tube with deflection means energized by horizontal and vertical sawtooth deflection potentials of such values that each video channel is reproduced on a selected one of the divided areas, comprising:

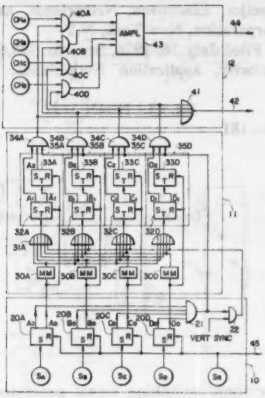
a channel selection circuit having a plurality of manually operated switches equal in number to said channels;

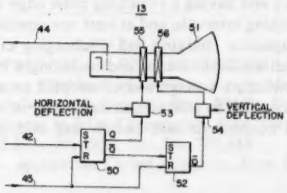
means for sequentially generating output pulses in each step with a vertical synchronization pulse contained in said video information in the same order of sequence as the operating sequence of said switches;

gate means responsive to said output pulses for passing said video information to said cathode ray tube; and

means responsive to said output pulses for generating a series of horizontal and vertical beam positioning DC potentials

for biasing said horizontal and vertical sawtooth deflection potentials, respectively, such that the video information passed through said gate means is reproduced on corresponding one of the divided areas of the screen.



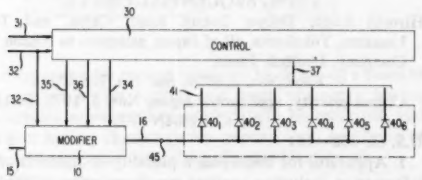


4,074,318

LED ARRAY IMAGING SYSTEM-SERIAL APPROACH

William John Kapes, Jr., Randolph Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 13, 1976, Ser. No. 750,113
Int. Cl.² H04N 5/66
U.S. Cl. 358—230 **9 Claims**



1. A facsimile system responsive to an input signal comprising:

a plurality of energy sources, each having a first type terminal and a second type terminal;

first means, connected to said first type terminal of each of said energy sources, for individually enabling said energy sources;

second means, responsive to said input signal, for simultaneously applying said input signal to each of said second type terminal of said energy sources; and

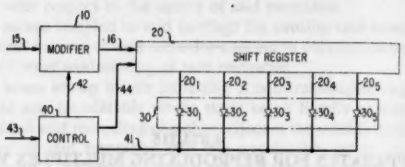
third means for controlling the time duration during which said second means applies said input signal to each of said second type terminals of said energy sources to effect a gray level control.

4,074,319

LIGHT EMITTING DIODE ARRAY IMAGING SYSTEM - PARALLEL APPROACH

Wilbur Harry Goldschmidt, Sparta; Hansjuergen Hermann Henning, Summit, and William John Kapes, Jr., Randolph Township, Morris County, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 13, 1976, Ser. No. 750,273
Int. Cl.² H04N 5/66
U.S. Cl. 358—230 **25 Claims**



1. A facsimile system comprising:

an array of pel energy sources, each having a first lead and a second lead;

a memory having a first plurality of parallel outputs;

first means for connecting said first leads of said energy sources to said first plurality of parallel outputs;

second means for connecting said second leads of said energy sources to a third plurality of terminals; and

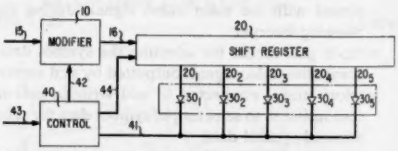
third means for simultaneously activating the pel energy sources of said array which are connected to each terminal of said third plurality of terminals.

4,074,320

HIGH QUALITY LIGHT EMITTING DIODE ARRAY IMAGING SYSTEM

William John Kapes, Jr., Randolph Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 13, 1976, Ser. No. 750,275
Int. Cl.² H04N 5/66
U.S. Cl. 358—230 **4 Claims**



1. In a facsimile receiver responsive to input signals, including a plurality of energy sources for illuminating the picture elements of a pictorial field, the improvement comprising:

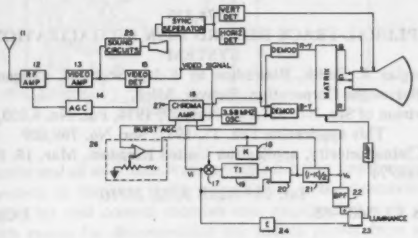
means for storing a correction constant corresponding to each of said plurality of energy sources; and

means for altering portions of said input signals destined for each of said energy sources in accordance with said correction constant corresponding to each of said energy sources wherein said correction constant corresponding to each of said plurality of energy sources relates multiplicatively to the energy output of each of said plurality of energy sources, and wherein said means for altering comprises a multiplier responsive to said input signals and to said correction constants.

4,074,321
CIRCUIT FOR SEPARATING CHROMA AND LUMINANCE INFORMATION IN A COMPOSITE VIDEO SIGNAL

William George Miller, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed Oct. 12, 1976, Ser. No. 731,190
Int. Cl.[2] H04N 9/00, 9/535
U.S. Cl. 358—31 12 Claims

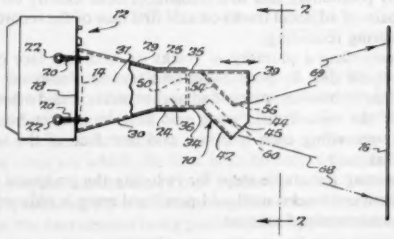


1. A comb filter of the type having a delay means, said delay means having an input terminal adaptively connected to a source of video signal and an output terminal for delivering a delayed video signal, means for combining said delayed video signal with said video signal to produce a filtered signal and means for supplying a portion of said filtered signal as a feedback signal from said means for combining to said delay means input terminal whereby said feedback signal is combined with said video signal, further comprising means for varying said feedback signal in response to the signal to noise ratio of said video signal.

4,074,322
TELEVISION PROJECTOR

Angelo M. Cammilleri, Williamsville, N.Y., assignor to Telejector Ltd., Cheektowaga, N.Y.

Filed Jan. 24, 1977, Ser. No. 761,950
Int. Cl.[2] H04N 5/74; G02B 5/136, 27/18
U.S. Cl. 358—237 9 Claims



1. Apparatus for projecting an optical image from the screen of a television receiver onto a generally planar viewing medium spaced therefrom comprising:

(a) an elongated housing having a longitudinal axis; an entrance opening at one end of said housing for receiving the optical image to be projected, and an exit opening adjacent the other end of said housing through which the image leaves for projecting onto the viewing medium, said housing adapted to be operatively associated with a television receiver with said entrance opening adjacent the screen of said receiver, said exit opening facing said viewing medium, and said housing longitudinal axis disposed in a plane generally perpendicular to the plane of the receiver screen;

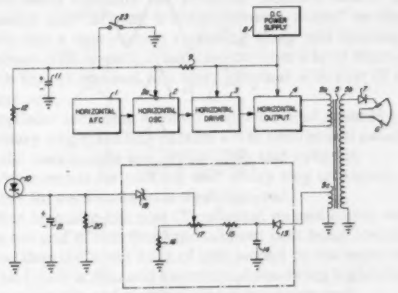
(b) a lens supported in said housing and disposed in a plane generally perpendicular to said housing longitudinal axis, the center of said lens being substantially coincident with said housing longitudinal axis, said lens receiving an optical image from said entrance opening and converting said image into an enlarged, inverted and reversed image; and

(c) a mirror combination including two plane reflecting mirror elements joined along an edge of each mirror defining a straight intersection, said intersection being disposed in each plane of the reflecting surfaces of said mirrors, said intersection being disposed in a plane containing said housing longitudinal axis, the reflecting surfaces of said mirrors being disposed to define an included angle of 90°, said mirror combination being located optically between said lens and said housing exit opening with said reflecting surfaces being disposed to receive an image toward said opening, said mirror combination inverting the received image and projecting the image onto the viewing medium.

4,074,323
TELEVISION RECEIVER PROTECTION SYSTEM

Donald E. Griffey, Skokie, Ill., assignor to Matsushita Electric Industrial Co., Ltd., Franklin Park, Ill.

Filed Apr. 14, 1976, Ser. No. 677,074
Claims priority, application Japan, May 7, 1975, 50-54980
Int. Cl.[2] H04N 5/68
U.S. Cl. 358—243 5 Claims



1. A protection system for a television receiver having a horizontal oscillator circuit, a horizontal flyback transformer, and a direct current power supply input terminal coupled with the horizontal oscillator circuit, said protection circuit including in combination:

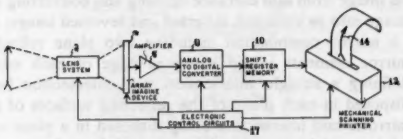
static latching switch means having a control terminal and coupled between the power supply input terminal and a point of reference potential;

transient suppression circuit means coupled with the control terminal of said static latching switch means; and coupling circuit means including a voltage threshold sensing means direct current coupled between the flyback transformer and the control terminal means of said static latching switch means for rendering said switch means conductive in response to voltages from the flyback transformer which produce voltages in excess of the threshold voltage of said voltage threshold sensing means to terminate operation of the horizontal oscillator circuit by reducing the direct current power applied thereto.

4,074,324
INSTANT ELECTRONIC CAMERA

Jon S. Barrett, 715 Dona St., Sunnyvale, Calif. 94087

Filed July 14, 1975, Ser. No. 595,628
Int. Cl.[2] H04N *1/04*
U.S. Cl. 358—296 4 Claims

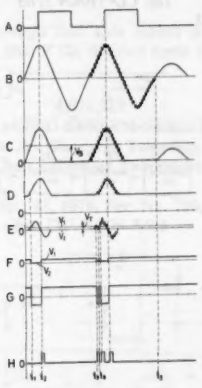


1. An instantaneous camera comprising a lens system; a solid state array imaging device having discrete light sensitive points whose accumulated charge is a function of the incident light; means for positioning said imaging device in predetermined relationship with said lens system; means for sensing charges at said points and generating in predetermined order a sequence of pulses whose amplitudes are a function of the respective instantaneous charges at said points; a printer responsive to said pulses and having means for direct production of visible marks; and means coupling said last-said means to said printer.

4,074,325
SYSTEM FOR SENSING THE PEAKS OF AN OUTPUT FROM A MAGNETIC HEAD

Yoshiaki Sakai, and Kuniki Murayama, both of Musashino, Japan, assignors to Teac Corporation, Tokyo, Japan

Filed Feb. 22, 1977, Ser. No. 770,785
Int. Cl.[2] G11B *5/09, 5/02*
U.S. Cl. 360—39 6 Claims



1. A system for sensing the peaks of an output produced by a magnetic head as the latter converts magnetic variations on a magnetic recording medium into electric variations, comprising in combination:

amplifier means for amplifying the output from said magnetic head;

half-wave rectifier means for effecting half-wave rectification of an output from said amplifier means;

differentiating circuit means connected directly to said half-wave rectifier means for differentiating an output therefrom;

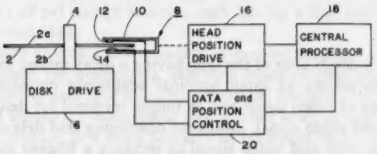
comparator means for comparing an output from said differentiating circuit means with a reference voltage having first and second levels and for producing an output voltage having third and fourth levels, said output voltage from said comparator means changing from said third to said fourth level when the output from said differentiating circuit means crosses said first level of said reference voltage and changing from said fourth to said third level when the output from said differentiating circuit means subsequently crosses said second level of said reference voltage, said first and said second levels of said reference voltage having a sufficiently great differential therebetween to prevent said comparator means from responding to noise which may be contained in the output from said differentiating circuit means; and

means connected to said comparator means for sensing the trailing edges of output pulses produced thereby.

4,074,326
PLURAL-TRACK RECORD DISK INITIALIZATION SYSTEM

Douglas A. Smith, Blairadam by Kelty, Scotland, assignor to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 527,896, Nov. 27, 1974, Pat. No. 4,030,130.
This application Feb. 17, 1977, Ser. No. 769,609
Claims priority, application United Kingdom, Mar. 15, 1974, 11610/74
Int. Cl.[2] G11B *5/02, 21/10*
U.S. Cl. 360—55 2 Claims



1. A method for recording an initial set of data tracks on a virgin plural-track record disk using a transducer head assembly which is comprised of: support means; a first transducer head carried by the support means and cooperable with a first face of a record disk; and a second transducer head carried by the support means and cooperable with the opposite face of the record disk, the second transducer head being fixed in a radially spaced relationship from the first head with respect to the disk, comprising the steps of:

recording a plurality of annular, spaced tracks on a first face of the record disk using said first transducer head, spacing said tracks twice the radial distance of the fixed relationship between said first and second transducer heads;

recording a plurality of annular, spaced tracks on the other face of the record disk using said second transducer head, by positioning said first transducer head exactly between pairs of adjacent tracks on said first face of the record disk during recording;

re-recording a plurality of tracks on said first face of the record disk by positioning said second transducer head exactly between pairs of adjacent tracks on said other face of the record disk, using said first transducer head for re-recording each track on said first face of the record disk; and

repeating the above steps for reducing the positional error between tracks, until said positional error is reduced to a predetermined amount.

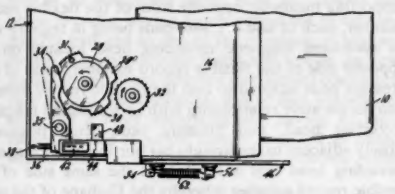
4,074,327
AUTOMATIC STOP SYSTEM FOR A TAPE RECORDER

Bernard Berger, New Rochelle, N.Y., assignor to Morse Electro Products Corporation, Brooklyn, N.Y.

Filed Jan. 21, 1976, Ser. No. 650,909
Int. Cl.[2] G11B *15/48, 21/08*
U.S. Cl. 360—74 4 Claims

1. In a tape player for a multi-channel tape including a tape head and means operative to move said multi-channel tape past said tape head, the combination comprising, switch means for coupling a source of power to said tape player, a deactivating member pivotably mounted on said tape player, means mounting said switch means for selective movement relative to the

movement path of said deactivating member and control means including an indexing member operatively mounted in said tape player for movement at the end of each tape channel and a control member positioned on said indexing member for engagement with one end of said deactivating member, the



opposite end of said deactivating member being positioned for movement in response to the engagement of the deactivating member by said control member into engagement with said switch means for disconnecting the source power from said tape player.

4,074,328

METHOD AND APPARATUS FOR RECORDING AND REPRODUCING INFORMATION ON A PLURAL-TRACK RECORD DISK

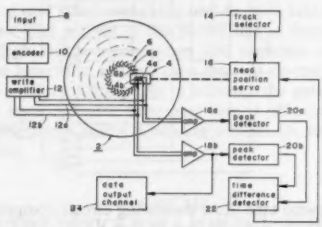
John F. Hardwick, Glenrothes, Scotland, assignor to Burroughs Corporation, Detroit, Mich.

Filed June 24, 1976, Ser. No. 699,273

Claims priority, application United Kingdom, June 27, 1975, 27288/75

Int. Cl.[2] G11B *21/10, 5/56*

U.S. Cl. 360—77 **10 Claims**



1. A transducer track-centering method utilizing a direct sensing of data position for reproducing retrievable informational data with respect to a selected one of a plurality of circular concentric tracks on a record disk, comprising: selecting a track on which the data is to be recorded; positioning with respect thereto transducer means including two recording-reproducing devices fixed at a predetermined angle to each other, the two devices being positioned at opposite sides of the center line of the selected track and at equal acute angles with respect thereto; utilizing both said recording-reproducing devices concurrently for recording said data so that the same data is recorded in two angular zones with respect to the center line of the selected track; utilizing both recording-reproducing devices concurrently for reading-out said so-recorded data from the angular zones of the selected track; outputting the data from one of the recording-reproducing devices to an output device; detecting any difference in the time that the outputted data is read-out from the one recording-reproducing device and the time that the same data is read-out from the other recording-reproducing device; producing an error signal corresponding to said time difference; and utilizing said error signal to move the transducer means in a substantially perpendicular direction with respect to the center line of the selected track in the direction tending to reduce the error signal to zero.

4,074,329

ROTARY HEAD TYPE MAGNETIC RECORDING AND REPRODUCING SYSTEM

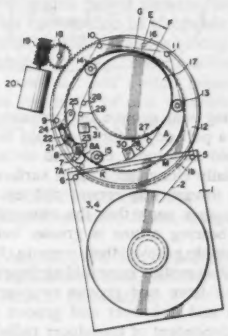
Hideki Sakumoto, Katano, and Yoshiteru Namoto, Moriguchi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 17, 1976, Ser. No. 658,754

Claims priority, application Japan, Feb. 19, 1975, 50-21174; Feb. 19, 1975, 50-21176

Int. Cl.[2] G11B *5/08*; G03B *1/56, 1/04*; G11B *5/008*

U.S. Cl. 360—85 **4 Claims**



1. A rotary head type magnetic recording and reproducing system comprising:

a. a tape cassette having an opening formed in one end accommodating a supply reel and a take-up reel, both said reels being coaxially and rotatably mounted within said cassette and carrying a magnetic tape wound on them such that a tape portion extending along said opening is inclined with respect to said cassette from a level identical with that of one reel to a level identical with that of the other reel;

b. a cylinder including a rotary magnetic head assembly;

c. a rotary ring extending parallel to the reels in said cassette in the loaded state and surrounding said cylinder;

d. a drive means for rotating said rotary ring selectively in either forward or reverse direction; and

e. a first tape take-out post (7) mounted on said rotary ring, the top end of said first tape take-out post being lower in level than the lower edge of tape wound on the upper one of said reels within said cassette and also being higher than the upper edge of tape wound on the lower reel;

said rotary ring being rotated at the time of tape loading for introducing said first tape take-out post into the inner side of the tape at a position closer to the upper reel and then causing the first post to engage the tape at a position closer to the lower reel and withdraw the tape progressively out of the cassette, thereby to pass the tape around said cylinder over a peripheral portion thereof subtending a predetermined angle.

4,074,330

FLEXIBLE DISK STORAGE APPARATUS

David Gibbons Norton, Boulder, and Gary Thorup Wright, Longmont, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 30, 1976, Ser. No. 719,023

Int. Cl.[2] G11B *15/64, 5/60, 5/82*

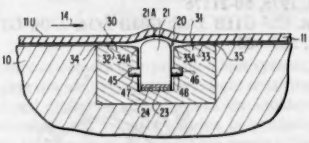
U.S. Cl. 360—102 **14 Claims**

1. Magnetic recording apparatus having a rotatable flexible circular record disk disposed over a flat plate, characterized in that:

said flat plate has an elongated groove opening to said flexible record disk and having a substantial radial length;

a transducer movably disposed for radial displacements along said groove for transducing operations with respect to said flexible record disk and substantially closed to axial air flow and to radial air flow at each radial extremity thereof and extending to be juxtaposed to a circumferential edge of said flexible record disk; and

pull down means having up-stream and down-stream air bearing means extending from said flat plate toward said flexible record storage disk and being respectively disposed along said groove on opposite sides thereof for inducing a pull down force on said flexible record disk toward said transducer, each said air bearing means having a radially elongated convex surface raised from said flat plate toward said record disk each with a radially extending apex such that the circumferential extent of both air bearing means is greater between the apexes adjacent said groove than remote from said groove whereby disk motion over said air bearing means tends to remove air from said groove to generate a pull down action on said disk over said groove and between said apexes independent of transducer radial position.



4,074,331

MAGNETIC RECORDING HEAD STRUCTURE FOR RECORDING ON BOTH SIDES OF A RECORD MEMBER

James Michael O'Reilly, Tillicoultry, and Alexander Smith Murison, Kirkcaldy, both of Scotland, assignors to Burroughs Corporation, Detroit, Mich.

Filed Oct. 1, 1976, Ser. No. 728,804

Claims priority, application United Kingdom, Oct. 3, 1975, 40492/75

Int. Cl.[2] G11B *5/48*

U.S. Cl. 360—104 **3 Claims**

1. A magnetic recording head assembly for recording information on opposite surfaces of a flexible record member comprising:

a pair of magnetic recording heads, each said recording head having a recording face adapted to contact a surface of the record member, said recording faces being of substantially D-shape and having a magnetic core transducer means eccentrically disposed thereon adjacent to and parallel to the straight bar of the "D", each of said magnetic core transducer means comprising a read/write core having a non-magnetic gap and low friction non-magnetic material aligned with the read/write magnetic core and a pair of erase cores having non-magnetic gaps disposed on opposite sides of the low-friction non-magnetic material;

means for supporting and positioning one of said pair of magnetic recording heads adjacent to one of the surfaces of said flexible record member and the other of said pair of magnetic recording heads adjacent to the opposite surface of the record member with the straight bar portions of said recording heads being parallel to and in close proximity to each other on opposite sides of said flexible record member; and

a pair of pressure pads supported by said positioning and supporting means on opposite sides of the flexible record member, each of said pressure pads being in registry with an associated magnetic recording head located on the opposite side of the flexible record member, each of said pressure pads adapted to bias the flexible record member into cooperative relationship with its associated magnetic recording head, said pressure pads being positioned closely adjacent to the straight bar portion of the magnetic recording head that is located on the same side of the flexible record member whereby the D-shape of the magnetic recording heads enables the compact arrangement of a pair of magnetic recording heads and their associated pressure pads.

4,074,332

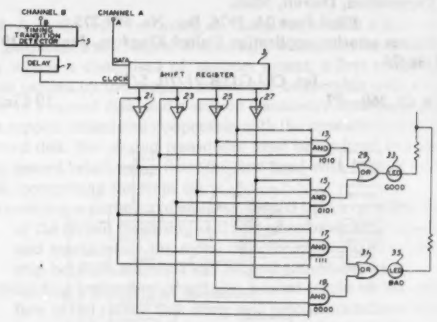
METHOD AND DIGITAL CIRCUIT FOR MEASURING SKEW OF MAGNETIC HEADS

Frank T. Innes, Chester, N.J., assignor to Litton Business Systems, Inc., Morris Plains, N.J.

Filed May 27, 1976, Ser. No. 690,710

Int. Cl.[2] G11B *5/43*

U.S. Cl. 360—137 **8 Claims**



1. A magnetic tape skew measuring circuit comprising:

a shift register means having at least two stages;

at least two AND cirucits, each coupled at its input to the output of said at least two stages of said shift register means;

an OR circuit means whose inputs are coupled to the output of only two of said AND circuits;

the outputs of each of said stages of said shift register means being coupled to each of said at least two AND circuits; and

first transmission means, coupled to the output of each stage of said shift register, for coupling the true and complement output signals from the second and first stages, respectively, to each of said AND circuits.

4,074,333

A.C. RELAY SYSTEM

Kanemichi Murakami; Yoshihiro Ishida, and Kazuo Okubo, all of Ise, Japan, assignors to Shinko Electric Company, Ltd., Tokyo, Japan

Filed July 15, 1976, Ser. No. 705,708

Int. Cl.[2] H01H *33/59*

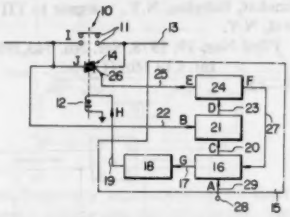
U.S. Cl. 361—13 **2 Claims**

1. An A.C. relay system for making and breaking an A.C. power line, comprising in combination:

an electromagnetic relay having contacts for making and breaking the power line and a coil for opening and closing said contacts;

a bilateral gated semiconductor connected across said contacts; and

a control circuit for controlling said relay and semiconductor, said circuit comprising; a sequence control unit receptive of an energizing signal from an external source, a phase detector having inputs connected to said sequence control unit and to one of the terminals of said semiconductor, a semiconductor firing unit having an input connected to said phase detector and outputs connected to the gate of said semiconductor and to said sequence control unit, and a relay energizing unit having an input connected to said sequence control unit and an output connected to said coil of the relay, said sequence control unit



being adapted to be actuated by said energizing signal to energize said phase detector, said phase detector energizing said semiconductor firing unit so as to fire said semiconductor when the phase angle of a voltage on the power line is zero, said semiconductor firing unit simultaneously producing a signal to said sequence control unit for actuating said relay energizing unit thereby actuating said relay and turning off said semiconductor, and upon cessation of said energizing signal said sequence control unit deenergizing said relay energizing unit to open said contacts so that a load current of the power line is directed to pass through said semiconductor, said sequence control unit upon lapse of a suitable time interval de-energizing said semiconductor firing unit to interrupt the gate signal, and said semiconductor becoming turned off when the load current drops below a holding current for said semiconductor.

4,074,334

PROTECTIVE DEVICE FOR A POWER ELEMENT OF AN INTEGRATED CIRCUIT

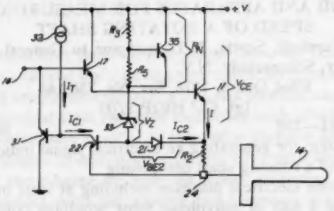
Sebastiano D'Arrigo, Sedriano (Milan), and Giovanni Ghiringhelli, Segrate (Milan), both of Italy, assignors to SGS-ATES Componenti Elettronici S.p.A., Agrate Brianza (MI), Italy

Filed Sept. 17, 1976, Ser. No. 724,463

Claims priority, application Italy, Sept. 18, 1975, 27341/75

Int. Cl.[2] H02H *7/20*

U.S. Cl. 361—79 **6 Claims**



1. In integrated circuitry including a power element traversed by an output current and a protective device for confining the values of said output current and of an accompanying voltage drop across said power element to a predetermined area of a current/voltage diagram partly bounded by a generally exponential curve,

the improvement wherein said protective device comprises:

an output resistance in series with said power element;

a monitoring amplifier with input connections across said output resistance, said input connections including a unidirectionally conductive component with a generally logarithmic conduction characteristic connected to a junction of said power element with said output resistance;

a threshold circuit connected across an input of said power element and controlled by said monitoring amplifier for shunting out part of an incoming signal upon said values approaching said boundary; and

a voltage-sensing network connected in series with said component across said power element, said network including a series combination of electronic switch means and two-terminal breakdown means having a substantially current-independent voltage upon reaching a predetermined firing potential, said switch means significantly modifying the resistance of said network in a voltage range exceeding said firing potential.

4,074,335

DETECTING CIRCUIT

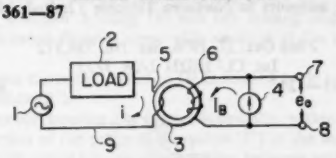
Kazuo Takasugi, Higashi-yamato, Japan, assignor to Hitachi, Ltd., Japan

Filed Jan. 21, 1976, Ser. No. 650,857

Claims priority, application Japan, Jan. 24, 1975, 50-9716

Int. Cl.[2] H02H *3/08, 5/04*

U.S. Cl. 361—87 **17 Claims**



1. A detecting circuit comprising:

at least one magnetic core having a rectangular magnetic characteristic;

at least one first winding means coupled magnetically to said magnetic core;

at least one second winding means coupled magnetically to said magnetic core;

first power supply means comprising an alternating current source connected to said first winding means, for applying a first current to be detected to said first winding means;

second power supply means comprising a direct current source connected to said second winding means, for applying a reference current to said second winding means;

means connected to said second winding means, for deriving at least one output signal from said second winding means; and

means connected to said first power supply means and said first winding means for changing the first current in response to a condition of an object.

4,074,336

PROTECTION CIRCUITS FOR COMPUTER BASED CONTROL SYSTEMS

Geoffrey Clarke, Blunsdon, near Swindon, England, assignor to Square D Company, Park Ridge, Ill.

Filed June 23, 1976, Ser. No. 699,135

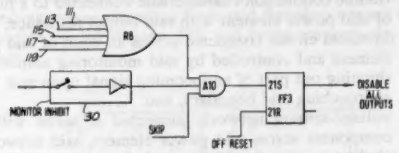
Claims priority, application United Kingdom, June 28, 1975, 27420/75

Int. Cl.[2] H02H *7/20*

U.S. Cl. 361—88 **5 Claims**

1. In a computer based control system, a protection circuit comprising first and second gating means responsive to input signals from the control system for generating output signals,

and disabling means responsive to the output signal from said first gating means for disabling the output of the control system, and input of the first gating means receiving an input signal at a predetermined time, or at the end of, a scan period of the control system, another input of said first gating means connected to the output of the second gating means, said second gating means having a number of inputs each connected to a respective part of the control system so that said second



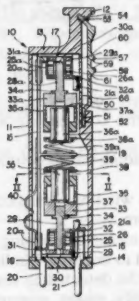
gating means passes its output signal to said first gating means on an occurrence of a fault at any one of said parts of the control system and said second gating means interrogates said number of inputs before an address of the control system takes place to determine that said parts of the control system are in the right state for causing said first gating means to activate, at said predetermined time, said disabling means for disabling all outputs of said control system.

4,074,337

PROTECTOR FOR TELECOMMUNICATION LINES

George Debortoli, and Detlef Zimmermann, both of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Oct. 27, 1976, Ser. No. 736,172
Int. Cl.[2] H02H *3/08, 3/22*
U.S. Cl. 361—124 **6 Claims**



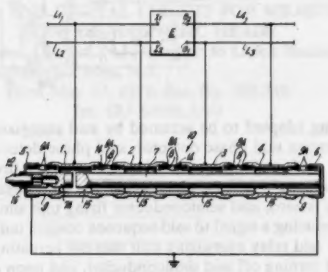
1. A protector for telecommunication lines, comprising:
an electrically insulating housing;
a metallic ground bar extending substantially the length of the housing, said ground bar including first and second end webs extending normal to the longitudinal axis of said housing, and a central web extending from the centre of the ground bar normal to said axis;
a first protection device extending between said centre web and said first end web and a second protection device extending between said centre web and said second end web;
each of said protection devices comprising an overcurrent device and an overvoltage device on a common axis parallel to said axis of said housing;
two pairs of pins extending from a base of said housing, each pair composed of an outside plant pin for connection to outside plant equipment and a central office pin for connection to central office equipment;
said overcurrent device in said first protection device connected between one pair of outside plant and central office pins, said overcurrent device in said second protection device connected between the other pair of outside plant and central office pins;
said overvoltage device in said first protection device connected between one of said outside plant pins and said ground bar and said overvoltage device in said second protection device connected between the other of said outside plant pins and said ground bar;
ground means connected to said ground bar for connection to a ground connector;
the arrangement such that actuation of an overcurrent device directly connects the related outside plant pin to said ground bar, and actuation of an overvoltage device directly connects the related outside pin to said ground bar.

4,074,338

MULTI-ELEMENT SURGE ARRESTER

Frank L. Simokat, Babylon, N.Y., assignor to TII Corporation, Lindenhurst, N.Y.

Filed Nov. 19, 1978, Ser. No. 743,298
Int. Cl.[2] H02H *9/06*
U.S. Cl. 361—129 **7 Claims**



1. A multi-element protector comprising:
1. a casing formed of an alternating succession of insulator elements and conductive elements sealably connected together to define an array of insulated generally annular electrodes,
2. an elongated electrode disposed within the interior of said elements to provide a common electrode for said annular electrodes and to define annular gaps therewith,
3. end caps connected to said array to cap said casing, at least one of said caps being electrically connected to said common electrode,
4. and at least said one end cap and each of said annular electrodes having means for connection to one of a plurality of equipment input and output terminals whereby a surge appearing across certain of said terminals causes ionization of the respective gap which triggers in turn ionization of the other gaps to minimize differential current flow between all of said terminals.

4,074,339

METHOD AND APPARATUS FOR MEASURING THE SPEED OF A ROTATING SHAFT

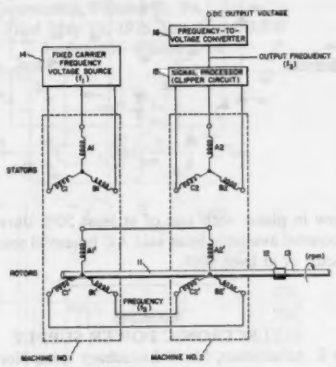
Fred G. Turnbull, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 6, 1976, Ser. No. 730,144
Int. Cl.[2] H02P *9/00*
U.S. Cl. 361—239 **10 Claims**

1. A system for generating an electrical signal indicative of the speed of a rotating shaft comprising
at least one electrical machine including at least one rotor having a pair of polyphase rotor windings coupled for rotation with the rotating shaft whose speed is to be measured, said polyphase rotor windings being connected together in parallel circuit relationship with the phase sequence of one rotor winding reversed as compared to

the other rotor winding, said electrical machine further including at least one stator having a pair of polyphase stator windings,

source means for applying to one stator winding a fixed carrier frequency polyphase voltage to thereby induce into one rotor winding a second polyphase voltage having



a second frequency representative of shaft speed and consequently induce into the other stator winding a third polyphase voltage having a third frequency also representative of shaft speed, and

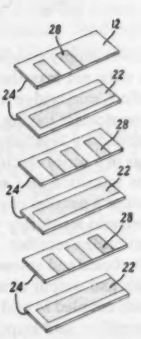
output means for deriving from the third induced polyphase voltage an output signal with a frequency indicative of the speed of the rotating shaft and direction of rotation.

4,074,340

TRIMMABLE MONOLITHIC CAPACITORS

William Conrad Leigh, Monroe, Conn., assignor to Vitramon, Incorporated, Monroe, Conn.

Filed Oct. 18, 1976, Ser. No. 733,089
Int. Cl.[2] H01G *4/34*
U.S. Cl. 361—321 **15 Claims**



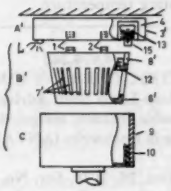
1. A multilayer monolithic ceramic capacitor comprising a dielectric material body having two major surfaces, a first side surface, a second side surface, a first end terminal and a second end terminal; at least two base electrodes each of which is in a plane substantially parallel to the major surfaces and each of which extends to and is coextensive with only the first end terminal there being no base electrodes extending to and in direct contact with the second end terminal; a conductive coating on the first end terminal which electrically interconnects each of the base electrodes extending to and coextensive with the first end terminal; and, at least one incremental electrode which extends, in a plane substantially parallel to the major surfaces, to, and is coextensive with, at least one side surface of the capacitor.

4,074,341

INTERLOCKED SEPARABLE FIRE SENSOR CONSTRUCTION

Werner Niederost, Schmerikon, and Bernhard Durrer, Stafa, both of Switzerland, assignors to Cerberus AG, Mannedorf, Switzerland

Continuation of Ser. No. 528,169, Nov. 29, 1974, abandoned.
This application May 24, 1976, Ser. No. 689,375
Claims priority, application Switzerland, Dec. 7, 1973, 17219/73
Int. Cl.[2] H02B *9/00*
U.S. Cl. 361—331 **12 Claims**



1. Interlocked, separable fire sensor construction having a socket element (A) adapted for mounting on a supoort including an outer socket housing (3), and a sensor element (B) including a sensor housing (6) and fire sensing and detection means located therein, removably secured to the socket element,

wherein the socket housing (3) is formed with a projecting portion (3″);

the sensor housing (6) fits telescopically within at least a portion of the projecting portion (3″) of the socket housing (3) while leaving a narrow gap between said housings; and

movable sensor element — socket housing interlock means (5, 15, 21; 8, 8′, 23) are provided comprising locking means (5, 15, 21) located on one of said elements (A) and matching engagement recess means (8, 8′, 23) formed on the other of said elements (B), said interlock means being located interiorly of the respective housing behind, and shielded by said projecting socket housing portion (3″) and, upon locking engagement of said elements, being accessible only through said narrow gap and being manually inaccessible, the locking means engaging in said recess means upon relative engaging movement of said elements and preventing disengaging movement of said elements upon engagement of said movable locking means in said recess means.

4,074,342

ELECTRICAL PACKAGE FOR LSI DEVICES AND ASSEMBLY PROCESS THEREFOR

James Joseph Honn, and Kenneth P. Stuby, both of Manassas, Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,967
Int. Cl.[2] H05K *1/04*
U.S. Cl. 361—411 **1 Claim**

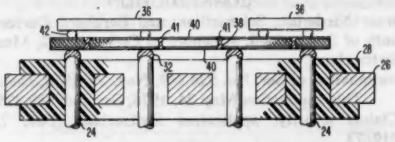
1. An electrical package for large scale integrated devices comprising

a. a carrier having terminal members supported therein having circuits thereon,

b. a circuit transposer attached to the carrier terminal members with at least one semiconductor active element mounted on the transposer, the transposer being of the same material as the active element,

c. the carrier being a plastic substrate, having a greater

coefficient of thermal expansion than the active element, and uniformally encapsulating an imbedded metallic web having a coefficient of thermal expansion lower than the active element to make the overall coefficient of expansion of the carrier equal to the active element,



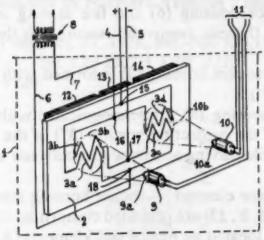
d. the coefficient of thermal expansion of the carrier, transposer and semiconductor active element being 3:3:3 when at operating temperature.

4,074,343

ELECTRIC CURRENT CHOPPER

Jacques Chaussy; Jean-Louis Bret; Adrien Berton, and Jacques Odin, all of Grenoble, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Oct. 20, 1976, Ser. No. 734,093
Claims priority, application France, Oct. 22, 1975, 75 32986
Int. Cl.[2] H02M *7/00*
U.S. Cl. 363—14 **10 Claims**



1. An electric current chopper for use with a cryostat, comprising resistance means having at least one superconductivity resistance component adapted to be maintained in the cryostat slightly below its superconductivity threshold and a controlled electroluminescent diode placed inside the cryostat for periodically emitting a light beam for heating the resistance component above its threshold.

4,074,344

HIGH POWER FACTOR AC TO DC CONVERTER CIRCUIT

Ira Jay Pitel, Williamsport, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Sept. 22, 1975, Ser. No. 615,503
Int. Cl.[2] H02M *1/14*
U.S. Cl. 363—44 **7 Claims**

1. A high power factor AC to DC converter circuit comprising:

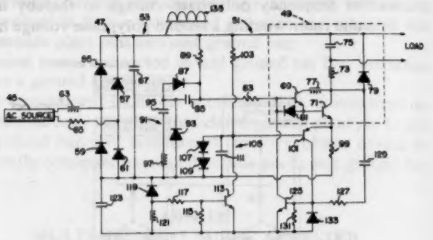
a load circuit;

switching regulator means for providing a DC potential, said switching regulator means including an oscillator circuit coupled to a control circuit with said oscillator circuit having an output circuit with a series connected inductor and capacitor, said capacitor coupled to said load circuit and said inductor coupled to a DC restorer connected to said oscillator circuit;

rectifier means for providing a full-wave rectified pulsating DC potential coupled to said switching regulator means;

a source of AC potential coupled to said rectifier means; and

a radio frequency current filter means connected in circuit with said rectifier means and switching regulator means, said filter means including a radio frequency responsive capacitor shunting said rectifier means a pulsating current



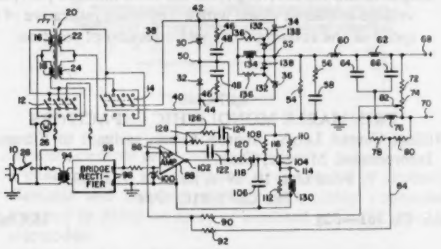
flow in phase with and of at least 50% duration of said potential available from said AC potential source a power factor of at least 90%.

4,074,345

ELECTRONIC POWER SUPPLY

Walter J. Ackermann, No. 6 Lounsbury Ave., Norwalk, Conn. 06851

Filed Nov. 2, 1976, Ser. No. 738,187
Int. Cl.[2] H02M *1/14*
U.S. Cl. 363—48 **2 Claims**



1. An electronic power supply comprising a full wave bridge rectifier having two adjacent legs thereof, utilizing a pair of silicone control rectifiers, said bridge rectifier having input and output terminals, a transformer having a pair of primary windings and a pair of secondary windings, first means to switch said primary windings in a series electrical circuit or a parallel circuit, second means to switch said secondary windings in a series electrical circuit or a parallel circuit independently operable of said first means, said secondary windings coupled to the input terminals of said bridge rectifier, a filter circuit including at least one series inductance and at least one shunt capacitance having input terminals and output terminals, said input terminals of said filter circuit coupled to said output terminals of said bridge rectifier, an amplifier, said amplifier having input terminals and output terminals, a voltage divider network, said voltage divider network coupled to said output terminals of said filter circuit, a pair of resistors, said pair of resistors coupled together in a series circuit in series with said input terminals of said filter circuit, said voltage divider network coupled to said input terminals of said amplifier, the juncture of said pair of resistors coupled to said input terminals of said amplifier, a uni-junction transistor, said uni-junction transistor having gate terminals and output terminals, said gate terminals of said uni-junction transistor coupled to said output terminals of said amplifier, a pulse transformer having a primary winding and a secondary winding, said primary winding of said pulse transformer coupled to said output terminals of said uni-junction transistor, said pair of silicone control rectifiers having

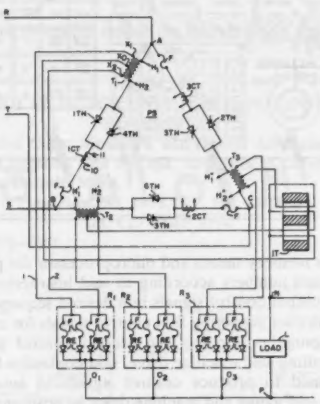
gate terminals, said secondary of said pulse transformer coupled to said gate terminals.

4,074,346

POWER SUPPLY PROTECTIVE CIRCUIT

John A. Riley, Williamsville, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 13, 1976, Ser. No. 685,825
Int. Cl.[2] H02M *1/18*
U.S. Cl. 363—50 9 Claims



1. A protective circuit for a power supply including an alternating current power source coupled to at least one bilateral controlled static power switch mounted in the primary of a transformer stage comprising:

means for detecting a voltage unbalance condition in said transformer primary for generating an error signal characteristic of said unbalance; and

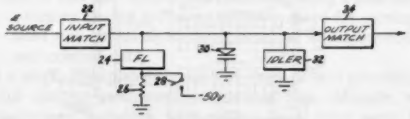
means operative in relation to said error signal for preventing damage to said power supply as a result from said unbalance; with said detecting means including means for integrating said unbalance condition over at least one cycle of said voltage alternating current power source.

4,074,347

VARACTOR FREQUENCY MULTIPLIER AND SWITCHING CIRCUIT

Roger D. Hall, Encino, Calif., assignor to The Bendix Corporation, North Hollywood, Calif.

Filed Sept. 17, 1976, Ser. No. 724,190
Int. Cl.[2] H02M *5/06*
U.S. Cl. 363—158 9 Claims



1. A frequency multiplying circuit including a varactor, a source of pulses of high frequency voltage of substantial power, filter means connected between said source and said varactor, an idler circuit connected to said varactor and band pass filter means connected to the output of said varactor, said varactor being self-biased such that it reaches a snap condition during which it generates harmonic frequencies:

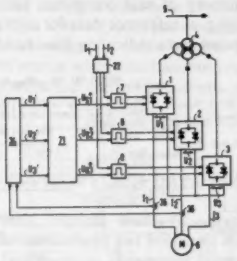
wherein the improvement comprises a drive circuit connected to said varactor including means supplying a negative-going gating pulse of voltage sufficient to bias said varactor to its off condition.

4,074,348

CIRCUIT ARRANGEMENT WITH A NUMBER OF CYCLOCONVERTERS, PARTICULARLY DIRECT CYCLOCONVERTERS IN Y-CONNECTION

Theodor Salzmann; Wolfgang Timpe, both of Erlangen, and Manfred Weibelzahl, Weiher, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 2, 1976, Ser. No. 663,131
Claims priority, application Germany, Mar. 3, 1975, 2509177
Int. Cl.[2] H02M *5/27*
U.S. Cl. 363—160 3 Claims



1. A circuit arrangement comprising:

an odd number *m* of Y-connected cycloconverters adapted to be connected to an AC network and to a symmetrical m-phase load without a direct connection between the Y-point of said cycloconverters and the Y-point of said load, said load having phase voltages of a predetermined periodic waveform and together forming a symmetrical system;

a number of control units for supplying control voltages to said cycloconverters such that each converter has an output voltage which is a periodic waveform comprised of a waveform corresponding to a predetermined one of said phase voltages and of a waveform of at least one harmonic of an odd order divisible by *m;*

a regulating device for generating *m* output voltages of periodic waveform;

and a converter stage for converting said output voltages and including means for supplying said converted output voltages to said control units, said converter stage converting said output voltages such that during each region from $\pi/3$ to $2\pi/3$ of a half wave of each particular output voltage that output voltage is reduced to $\sqrt{3}/2$ times its peak value and the other two output voltages are increased by an amount equal to the difference between said peak value and $\sqrt{3}/2$ times said peak value.

4,074,349

METHOD AND A SYSTEM OF NUMERICALLY CONTROLLING A CUTTING MACHINE

Masanobu Ueda, Suita, Japan, assignor to Dainichi Kinzoku Kogyo Co., Ltd., Amagasaki, Japan

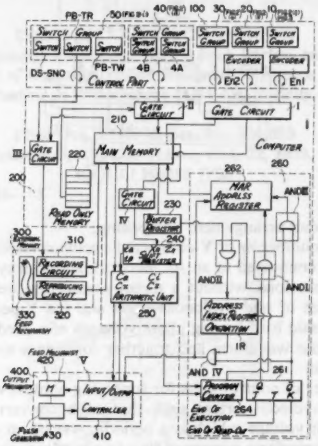
Filed Oct. 22, 1975, Ser. No. 624,993
Claims priority, application Japan, Apr. 9, 1975, 50-43636
Int. Cl.[2] G06F *15/46*
U.S. Cl. 364—107 6 Claims

1. A method for numerical control of the displacement of a working tool with respect to a rotated article according to a computer having a main memory capable of storing an executing program block and data; an executing part for executing arithmetic operation according to said executing program block; a read only memory storing plural executing program blocks therein; an input-output controller for controlling the transfer of signals to an external device; and a control unit for

controlling the introduction of the executing program block from the read only memory into the main memory, the read out of one instruction of the executing program block, the read out of the data of the main memory by said executing program block, the execution of arithmetic operation of the executing part, and the transfer of signals by the input-output controller; comprising

a. a step of first coding a data group concerning the limit displacing distances of said working tool in the radial and axial directions of said rotated article and storing thus coded signals with sequential codes in the main memory of said computer;

b. a step of second coding a data group for determining the distance of displacement of said working tool according to the mode of working and storing thus coded signals into the main memory of said computer, said data group at least containing, as reference data for coordinate values of work start point, data indicating the coordinate values of



position of the blades of said working tool with respect to the rotational center of said article at an end face thereof from which the working is to be started, said working tool being stopped at said position after a trail working on said rotated article;

c. a step of selecting one of said plural executing program blocks and introducing thus selected program block into said main memory of said computer;

d. a step of introducing, upon reception of a work start signal, said coded signals with sequential codes into the executing part of said computer according to the instruction signals of said executing program block stored in said main memory; and

e. a step of introducing pulse train signals proportional to the distance of displacement of said working tool into the executing part of said computer and controlling the displacement of said working tool by means of an output signal obtained from said computer.

4,074,350

SOFT-WIRED MACHINE TOOL CONTROL

Gerald V. Roch, Indianapolis, Ind., and James P. Wiles, Olean, N.Y., assignors to Hurco Manufacturing Company Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 558,213, March 14, 1976. This application Mar. 3, 1976, Ser. No. 663,538

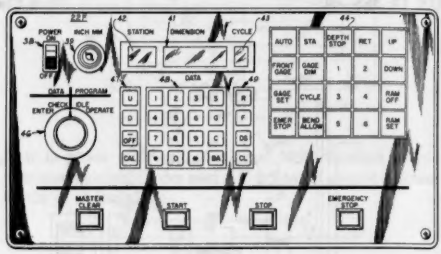
Int. Cl.[2] B21D *5/02*

U.S. Cl. 364—107 **10 Claims**

1. In positioning apparatus for machines, the improvement comprising:

a machine drive means, and a workpiece material locating gauge;

a controller having read-only memory means therein and random access memory means therein and a microprocessor therein and a numerical keyboard for sequential entry into said random access memory means of a group of gauge and machine drive position data numbers to identify gauge and machine drive position to be achieved, and additional keys for entry of instructions to said random



access memory means and microprocessor for processing said data numbers according to said instructions to produce output control signals in a desired sequence;

said controller supplying first control signals for controlling said gauge positioning and second control signals for controlling said machine drive, said controller being programmed to produce control signals to automatically drive said gauge and machine drive to positions in accordance with said position data in sequence according to said instructions.

4,074,351

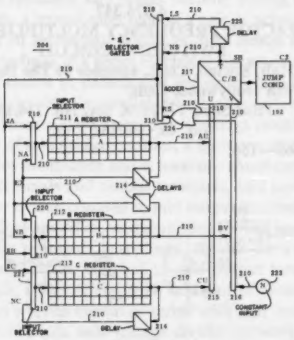
VARIABLE FUNCTION PROGRAMMED CALCULATOR

Gary W. Boone, Sunnyvale, Calif., and Michael J. Cochran, Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 529,251, Dec. 2, 1974, abandoned, which is a division of Ser. No. 420,999, Dec. 3, 1973, which is a continuation of Ser. No. 163,565, July 19, 1971, abandoned. This application Feb. 24, 1977, Ser. No. 771,498

Int. Cl.[2] G06F *15/04*

U.S. Cl. 364—200 **20 Claims**



1. A calculator system implemented in large-scale-integrated semiconductor means comprising:

(a) addressable storage means included in the semiconductor means for storing fixed program instructions to control the operation of the calculator system;

(b) a plurality of separate control means included in the semiconductor means coupled to said addressable storage means and responsive to said program instructions for

decoding the program instructions and generating control signals in accordance with said program instructions;

(c) data register means included in the semiconductor means for storing and shifting in parallel a plurality of multi-bit words of coded information;

(d) parallel arithmetic-logic means included in the semiconductor means coupled to said control means and to said data register means for performing parallel arithmetic and logic operations on said multi-bit words in accordance with said control signals to provide resulting answers;

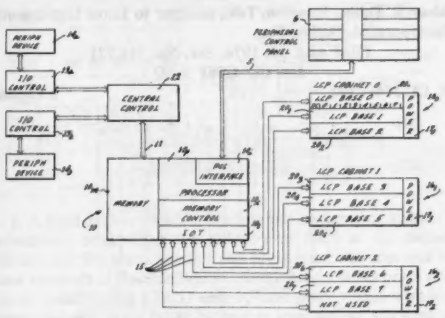
(e) input means coupled to said data register means for inputting said coded information into said data register means; and

(f) output means for outputting said resulting answer.

4,074,352
MODULAR BLOCK UNIT FOR INPUT-OUTPUT SUBSYSTEM

Darwen John Cook, Alhambra, and Donald Alexander Millers, II, San Clemente, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Sept. 30, 1976, Ser. No. 728,456
Int. Cl.[2] G06F *3/04*
U.S. Cl. 364—200 **11 Claims**



1. In a digital system for the transfer and control of digital information between a first main system which includes a processor with main memory having an I/O translator interface unit, and a plurality of remote peripheral terminal units, wherein each peripheral terminal unit is connected to the main system via a corresponding line control processor, and wherein groups of said line control processors at a given site are organized into Base Modules, a Base Module unit comprising:

(a) a plurality of line control processors, each of which has its own dedicated connection to a corresponding peripheral terminal unit and wherein each of said line control processors is adapted to handle the particular discipline required by its corresponding peripheral terminal unit,

each of said line control processors including a data buffer memory having sufficient memory space for storing at least one complete message block of information data and control data;

(b) a single backplane common to each of said plurality of line control processors within said Base Module, said backplane including transmission lines from each line control processor to a distribution-control means, said transmission lines being selectively activated by said distribution-control means;

(c) connection means for connecting of each said plurality of line control processors with a dedicated transmission line to its corresponding peripheral terminal so that each peripheral terminal has an unimpeded exclusive line connection to its corresponding line control processor;

(d) a distribution-control means including:

(d1) message level interface means including logic means to connect a data path having a standard transmission discipline to said I/O translator interface of said main system, said message level interface operating to transfer a stream of characters without interruption until a complete message block is transferred;

(d2) means to signal said main system if an addressed line control processor is busy;

(d3) means to signal said main system if an addressed line control processor is available, and to connect said addressed line control processor to said main system;

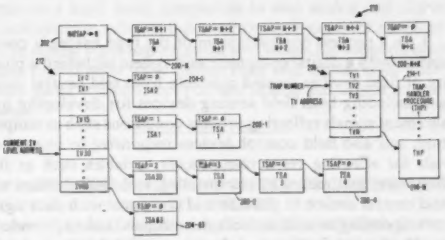
(d4) means, when a line control processor requests access, to connect said requesting line control processor to said main system, by activation of selected backplane transmission lines to said line control processor requesting access;

(d5) means for setting a local base priority value number for each line control processor within a given base module, and using said value number for determining priority of access when simultaneous requests for access occur between line control processors in the same Base Module.

4,074,353
TRAP MECHANISM FOR A DATA PROCESSING SYSTEM

William E. Woods, Natick; Philip E. Stanley, Westboro; Kenneth J. Izbicki, Hudson, and Steven C. Ramsdell, Lowell, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed May 24, 1976, Ser. No. 689,014
Int. Cl.[2] G06F *9/20, 11/00*
U.S. Cl. 364—200 **13 Claims**



1. A trap mechanism in a data processing system which includes a central processing device, a memory device and a plurality of data processing devices, each of said devices coupled to a system bus for the transfer of data thereover, each of said devices having an interrupt level associated therewith, said interrupt levels indicating priorities for gaining access to said system bus, an interrupt level of a first priority will have precedence to said system bus over a said device having an interrupt level of a second priority, said mechanism further comprising:

A. a plurality of trap save areas, in said memory device each of said areas including a plurality of locations for storing information;

B. first means for linking said plurality of trap save areas with each other to form a pool of said trap save areas, said means for linking including pointer means in each of said areas for pointing to another of said areas so that a first said area points to a second said area and so that second said area points to a third said area until a next to last said area points to a last said area;

C. means for indicating the interrupt level specified by one of said devices which requires the processing of data and which requires the execution of a process in said system;

D. means, responsive to a predetermined condition in said system, for loading said locations in one of said areas with information from predetermined sources in said system;

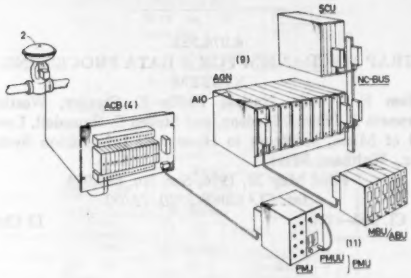
E. means, responsive to said predetermined condition, for unlinking said one of said areas from said pool of said areas; and

F. second means, responsive to said predetermined condition, for linking said linked said one of said areas with said process associated with the device having the interrupt level indicated by said means for indicating.

4,074,354
PROCESS CONTROL SYSTEM

Mutsuaki Nakagawa; Yutaka Wakasa; Hisayuki Uchiike, and Susumu Nagata, all of Musashino, Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan

Filed June 3, 1976, Ser. No. 692,329
Claims priority, application Japan, June 17, 1975, 50-73426
Int. Cl.[2] G06F *3/04*
U.S. Cl. 364—200 **6 Claims**



1. In a process control system of the type having a central station with a digital computer; said system including a plurality of field devices located remotely from said central station and including both field sensing devices for developing measurement signals reflecting process conditions such as temperature, and also field control devices responsive to control signals for affecting respective process variables such as fluid flow rate; and means interconnecting said field devices with said central station to provide said computer with data signals corresponding to said measurement signals, and to provide for sending to said field control devices control signals responsive to the digital output signals developed by said computer representing commands for said field control devices; said interconnecting means comprising:

(a) means at said central station responsive to said digital output signals for developing intermediate control signals of common format, each intermediate control signal serving to convey a command for a respective field control device;

(b) a plurality of signal converting units each assigned to a corresponding field control device and serving to transform the intermediate control signal for its assigned device to an analog control signal in the form of a variable current the magnitude of which represents the command for the respective field control device;

(c) a first plurality of analog signal transmission lines each connecting the output of a respective one of said converters to its corresponding field control device to provide for the actuation of that device in accordance with the magnitude of the corresponding analog control signal;

the system further including maintenance backup apparatus comprising:

(1) an analog signal generator located at said central station and operable to develop a manually-settable backup analog signal;

(2) a second plurality of analog signal transmission lines each assigned to a corresponding one of said field control devices;

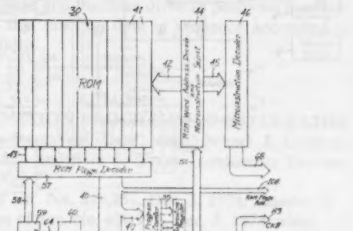
(3) a selector unit for said analog signal generator including means for connecting said back-up analog signal to one end of any selected one of said second plurality of analog signal transmission lines assigned to a selected one of said field control devices; and

(4) switch means operable to interrupt the connection between the output of any said selected converter unit and the corresponding one of said first plurality of transmission lines, and to establish a connection between said corresponding one transmission line and the other end of said selected one of said second plurality of transmission lines, said settable backup analog signal thereby being transmitted from said analog signal generator to the particular field control device normally supplied with an analog control signal by said selected converter unit, whereby that selected converter unit can if necessary be removed for servicing while its assigned field control device is actuated by the analog backup signal from said signal generator.

4,074,355
DIGITAL MICROPROCESSOR SYSTEM WITH SHARED DECODE

Graham S. Tubbs, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 16, 1976, Ser. No. 714,721
Int. Cl.[2] G06F *9/00*
U.S. Cl. 364—200 **9 Claims**



1. An electronic digital processor system of the type having:

at least one logic unit having a plurality of command inputs, the logic unit executing functional operations in response to operation commands;

memory means for storing instruction words which define the operation of the logic unit and other parts of the system, and addressing means for accessing the memory means;

control means including a programmable logic array having first and second sections, said control means receiving instruction words from the addressable memory means and generating therefrom a plurality of operation commands, the operation commands being coupled to said command inputs;

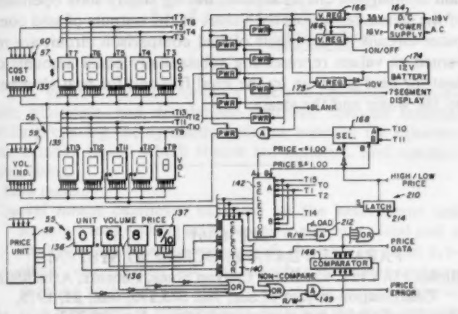
timing means for generating timing signals for defining a machine cycle including a first interval during which an address is delivered to said addressing means and including a second interval during which an instruction word is delivered to the control means to generate operation commands; the improvement wherein:

the processor system includes a shared decoder having an input and first and second outputs, the first output being connected to the memory means and the second output being connected to said second section of said programmable logic array in said control means, whereby said decoder forms part of said addressing means during the first interval and forms said first section of said programmable logic array during the second interval.

4,074,356
FLUID DELIVERY CONTROL AND REGISTRATION SYSTEM

Robert J. Schiller, Simsbury, and Theodore Charles Perrill, Vernon, both of Conn., assignors to Veeder Industries, Inc., Hartford, Conn.

Filed Sept. 7, 1976, Ser. No. 720,789
Int. Cl.[2] B67D *5/16*; G06F *15/56*
U.S. Cl. 364—465 **28 Claims**



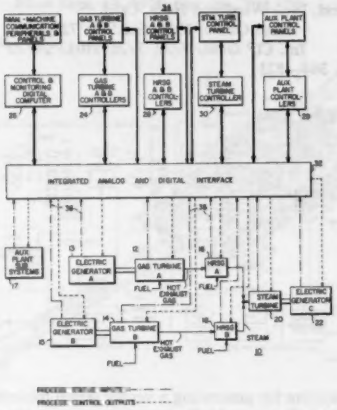
1. A fluid delivery station control and registration system for selectively controlling the delivery of fluid at the delivery station and for accumulating and registering the cost and volume amounts of fluid delivered, comprising a BCD price selector for establishing a BCD unit volume price within a multiple place decimal price range having at least dollar, ten cent and cent places, pulses means for providing a relatively high and low frequency volume pulse trains having 1000 and 100 pulses per unit volume respectively with a volume pulse for approximately each predetermined decimal increment of fluid delivered, selector means for selecting the relatively high frequency pulse train when the established BCD unit volume price is at least 1 dollar and the relatively low frequency pulse train when the established BCD unit volume price is less than 1 dollar, electronic storage memory circuit means having an electronic storage memory for accumulating and storing the cost and volume amounts of fluid delivered, and storage memory control means for selectively resetting the storage memory and for operating the storage memory circuit means for accumulating and storing in the storage memory the cost and volume amounts of fluid delivered in accordance with the established BCD unit volume price and the number of volume pulses of the selected pulse train.

4,074,357
ANALOG CONTROL AND DIGITAL SYSTEM WITH INTEGRATED INTERFACE FOR ELECTRIC POWER AND OTHER PLANTS

Rash B. Gupta, West Deer Township, Pittsburgh County, and David L. Armstrong, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 15, 1976, Ser. No. 705,631
Int. Cl.[2] F02C *9/02*
U.S. Cl. 364—494 **7 Claims**

1. An integrated digital/analog control system for an electric power or other industrial plant comprising an analog control system and a digital control system, said control systems having means for generating outputs which control the plant in response to input signals therefrom, a plurality of plant transducers and transmitters generating respective input analog signals for use in controlling the plant, respective circuit means for powering each of said analog transmitters and for generating buffered analog signals corresponding to the transmitted analog signals and being compatible with both said analog and digital control systems, an analog input information panel for terminating the buffered analog signals, means for coupling each of said buffered analog input signals from said analog

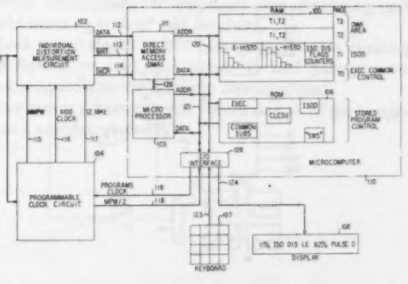


input information panel to one or both of said analog and digital control systems, a plurality of plant contacts generating respective input digital signals for use in controlling the plant, respective circuit means for conditioning each of said digital signals to a logic level compatible to said analog and digital control systems, a digital input information panel for terminating the digital input logic signals, and means for coupling each of said digital input logic signals from said digital input information panel to one or both of said analog and digital control systems.

4,074,358
TEST SET FOR MEASURING JITTER DISTORTION OF DATA PULSES

Salvatore Caputo, Long Branch; Scott McDowell Fitch, Holmdel, both of N.J.; Cliff Andrew Harris, Albuquerque, N. Mex.; John Kuhar, Jr., Middletown, N.J.; Andrew Leo Pappas, Tinton Falls, N.J., and Wayne Redlich, Freehold, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 2, 1976, Ser. No. 746,809
Int. Cl.[2] G01R *29/02*; H04B *15/00*; G06F *15/20*
U.S. Cl. 364—514 **17 Claims**



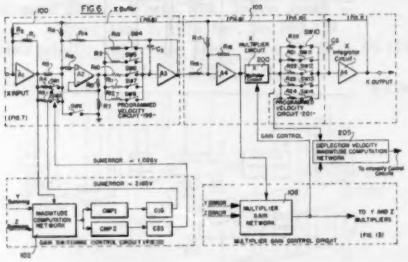
1. A test set for measuring distortion of incoming pulses comprising means responsive to the incoming pulses for constructing a standard pulse, means for generating digital repre-

sentations of relative positions in time of the incoming pulses and the standard pulse, means for processing the digital representations of the relative time positions of each of a plurality of the incoming pulses and the standard pulse to obtain the quantity of distortion of the incoming pulse and means for compiling the number of times each distortion quantity is obtained.

4,074,359
VECTOR GENERATOR

Ralph D. Hasenbalg, Canoga Park, Calif., assignor to Vector General, Inc., Woodland Hills, Calif.

Filed Oct. 1, 1976, Ser. No. 728,544
Int. Cl.[2] G06G *7/22, 7/26;* H01J *29/70*
U.S. Cl. 364—521 **10 Claims**

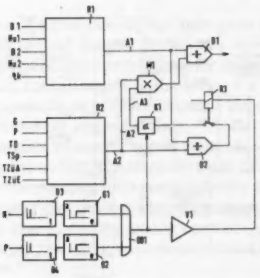


1. A system for generating a vector signal including: circuit means including a multiplier circuit; an integrator coupled to the output of said circuit means; a gain control circuit; means connecting said gain control circuit to said multiplier circuit to control the gain of the multiplier circuit to cause the multiplier circuit to generate a constant output so as to constitute a constant current source for said integrator for linear integration thereby; and a computing network for increasing the dynamic range of the system, said computing network generating an output representing the function (F–I)A; where F represents an end point, I represents the instantaneous value of the output of the system, and A is a value which changes as the output moves towards the end point F

4,074,360
FUEL AND FEEDWATER-MONITORING SYSTEM OF A ONCE-THROUGH STEAM GENERATOR

Lothar Stadie, Hochstadt, and Eberhard Wittchow, Erlangen, both of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed May 9, 1977, Ser. No. 795,023
Claims priority, application Germany, May 11, 1976, 2620734
Int. Cl.[2] G01L *03/26*
U.S. Cl. 364—551 **6 Claims**

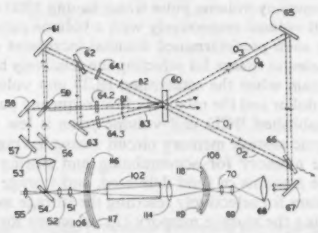


1. Monitoring system for a once-through steam generator for determining deviations between the amount of heat absorbed by the water and the steam of the generator and the amount of heat given off by a firing system for the generator during operating conditions that are not steady-state, as compared to steady-state operation, comprising a first computing circuit responsive to a signal corresponding at least to an amount of fuel for determining a value approximately proportional to the amount of heat given off by the fuel, a second computing circuit responsive to a signal corresponding at least to an amount of feedwater for determining a value approximately proportional to the amount of heat absorbed by the water and the steam, a comparison circuit having inputs connected to respective outputs of said first and second computing circuits, a correction circuit connected between the output of one of said computing circuits and the respective input of said comparison circuit, said correction circuit including a correction member having an output variable only during an operating condition of the steam generator that is not steady-state, said variable output having an effect upon the value of the output of said one computer circuit that is fed to the respective input of said comparison circuit so that, during steady-state operation of the steam generator, the values of the outputs of said computer circuits to the inputs of said comparison circuit are returned as values representing substantially equal amounts of heat for heat given up by the fired fuel and for heat absorbed by the water and the steam.

4,074,361
PARALLEL DATA PROCESSING SYSTEM

Richard G. Clow, 624 Black Canyon Stage, Phoenix, Ariz. 85020

Continuation-in-part of Ser. No. 543,173, Jan. 22, 1975, abandoned, which is a continuation of Ser. No. 398,332, Sept. 18, 1973, abandoned, which is a continuation of Ser. No. 117,784, Feb. 22, 1971, abandoned, which is a continuation of Ser. No. 720,262, April 10, 1968, abandoned. This application May 3, 1976, Ser. No. 682,731
Int. Cl.[2] G06G *9/00;* G03H *1/00;* H01S *3/101*
U.S. Cl. 364—713 **23 Claims**



1. A data processor, comprising:

a multi-mode threshold laser, having at least 25 independent, traveling wave modes, all of substantially the same frequency;

a source of coherent optical radiation of the same frequency as said modes of the multi-mode threshold laser; and

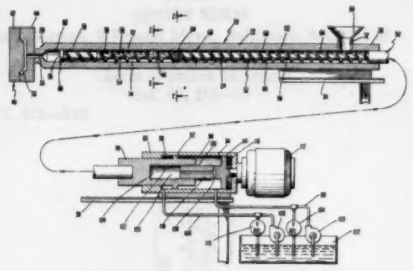
a coherent optical computer, for diffracting coherent optical radiation derived from said source and using the diffracted coherent optical radiation to produce twenty-five distinct output beams which are substantially reversals of the beams emitted by said modes of the multi-mode threshold laser; placed adjacent to the multi-mode threshold laser with said output beams impinging on the multi-mode threshold laser; so that each beam of said output beams is injected into exactly one mode of said modes and the oscillation of said mode may be initiated by said output beam.

4,074,362

VENTED INJECTION MOLDING MACHINE

George A. Kruder, Marion, and Clyde S. Gudermuth, Jr., Mount Gilead, both of Ohio, assignors to HPM Corporation, Mount Gilead, Ohio

Filed Nov. 19, 1976, Ser. No. 743,489
Int. Cl.[2] B29B *1/06*
U.S. Cl. 366—82 9 Claims



1. A vented injection molding machine operable to masticate, plasticate, and devolatilize synthetic resinous material while preparing the synthetic resinous material for injection into a mold cavity which shapes the material, said machine comprising:

base means;

barrel means cantilever mounted on the base means and having a longitudinal screw-receiving bore, a distal end, a feed opening communicating with the bore to admit synthetic resinous feed material, a discharge opening communicating with the bore at the distal end to deliver material to a mold, and a vent opening between the feed opening and the discharge opening to exhaust liberated gases;

a rotatable reciprocable screw positioned in the screw-receiving bore and including

a first stage having a protruding screw flight with a first pitch, communicating with the feed opening, and operable with the barrel means to receive, masticate and substantially complete plastication of synthetic resinous material,

protruding ring means downstream of the first stage, upstream of the vent opening, cooperating with the first stage to tolerate a variety of synthetic resinous materials, and operable to meter the flow of plasticated material from the first stage, and

a second stage having a protruding screw flight with an axially short pumping section at the downstream end, communicating with the vent opening and the discharge opening, having a second pitch that exceeds the first pitch so that the first stage and the ring means starve feed the second stage to reduce the tendency of material to bleed from the vent opening operable with the barrel means to devolatilize plasticated synthetic resinous material upstream of the short pumping section and to advance the plasticated devolatilized material through the short pumping section without substantial pressurization; and

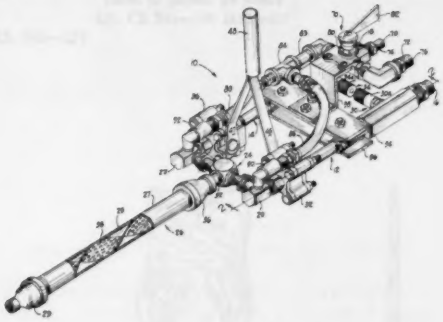
operating means mounted on the base means, connected with the screw, operable to rotate the screw within the barrel means during plastication of the material, operable to retract the screw from the discharge opening during plastication, and operable to move the screw longitudinally toward the discharge opening while expelling accumulated material therethrough.

4,074,363

APPARATUS FOR GENERATING PLASTIC FOAM

John C. Croft, Barberton, Ohio, assignor to Ric-Wil, Incorporated, Brecksville, Ohio

Filed Sept. 17, 1976, Ser. No. 724,378
Int. Cl.[2] B01F *15/02*
U.S. Cl. 366—138 1 Claim



1. Gun-type apparatus for generating plastic foam comprising:

(a) a pair of conduits each connectible at one end to individual supplies of foam material,

(b) an adjustable flow control valve in each conduit,

(c) a manually actuated ball valve in each conduit downstream from each said flow control valve,

(d) adjacent operating handles extending from said ball valves,

(e) means for selectively connecting said handles together for joint actuation, said connecting means being operably disassociable from said handles to permit individual actuation thereof,

(f) a manifold connected to said conduits downstream from said ball valves,

(g) a tubular mixing head connected to said manifold,

(h) twisted perforated strip means extending lengthwise of said mixing head and dividing the interior of said into spiral mixing paths that communicate with each other along the length of said strip through its perforations,

(i) a pressurized air inlet,

(j) a solvent inlet,

(k) passageway means connecting said inlets to said conduits at locations downstream from said ball valves,

(l) selector valve means for selectively communicating each of said inlets to both of said conduits,

(m) check valve means in said passageway means enabling fluid flow from said inlet means to said passages, but preventing flow in the opposite direction, and

(n) frame means supporting and connecting all of the foregoing as a unitized assembly.

DESIGNS

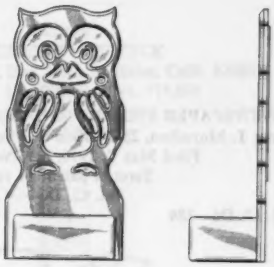
FEBRUARY 14, 1978

247,201
SPORT SHOE
Morris L. Krome, 9 Roland Mews, Baltimore, Md. 21210
Filed Apr. 23, 1976, Ser. No. 679,821
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310

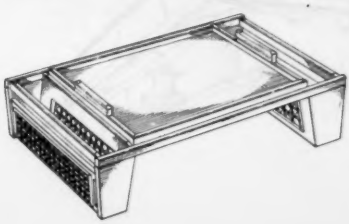
247,202
ATHLETIC HOSE
Henry P. Mueller, 800 Garfield St., Hobart, Ind. 46342
Filed Jan. 21, 1976, Ser. No. 651,057
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—330

247,203
COMBINATION ACCESSORY TRAY AND BOOK SUPPORT FOR BATHTUBS OR THE LIKE
Gus Levin, 4515 N. Braeswood, Apt. 302B, Houston, Tex. 77035
Filed Feb. 12, 1976, Ser. No. 657,689
Term of patent 14 years
Int. Cl. D23—*02;* D6—*04*
U.S. Cl. D6—91

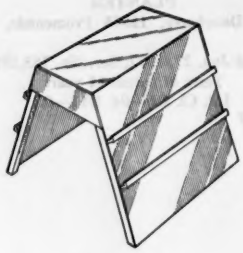
247,204
PLANTER
Gaye Lorraine Daugherty, 12643 Promenade, Dallas, Tex. 75238
Filed Jan. 27, 1977, Ser. No. 763,291
Term of patent 14 years
Int. Cl. D6—*04;* D11—*02*
U.S. Cl. D6—137



247,205
BED TRAY
Jose P. Mabugat, Cebu City, Philippines, assignor to Linrose Sales Corporation, Marina del Rey, Calif.
Filed Oct. 28, 1976, Ser. No. 736,384
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—138

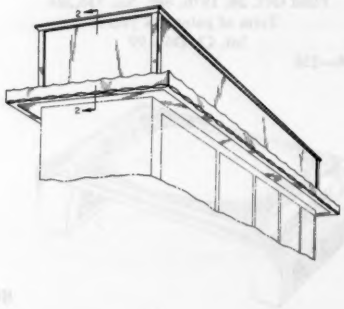


247,206
READING RACK FOR CHILDREN
Douglas J. Hermann, and Lynda S. Hermann, both of 1430 Bruce Lane, Green Bay, Wis. 54303
Filed July 26, 1976, Ser. No. 708,412
Term of patent 7 years
Int. Cl. D6—*04*
U.S. Cl. D6—184

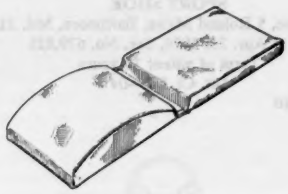


247,207
NEWSPAPER STORING AND BUNDLING DEVICE
James T. Moynihan, 25 Johnson St., Newington, Conn. 06111
Filed May 7, 1976, Ser. No. 684,172
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—184

247,208
COMBINED CABINET SOFFIT AND PLATE SUPPORT UNIT
Ronald D. Pearson, 22015-146th Ave. East, Graham, Wash. 98338
Filed Dec. 8, 1975, Ser. No. 638,369
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—191

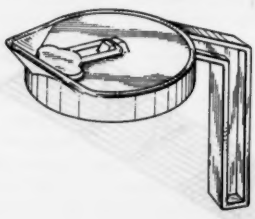


247,209
PATIENT POSITIONING CUSHION
James N. Woog, 11572 65th Place North, Maple Grove, Minn. 55369
Filed Nov. 17, 1975, Ser. No. 632,513
Term of patent 7 years
Int. Cl. D6—*09*
U.S. Cl. D6—201

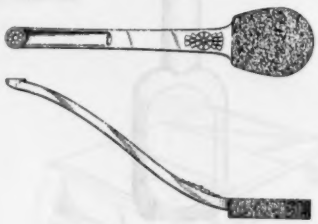


247,210
COMPOTE
Arthur L. Harshman, Dunkirk, Ind., and James I. Messmer, Detroit, Mich., assignors to Florists' Transworld Delivery Association
Filed May 17, 1976, Ser. No. 687,184
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—22

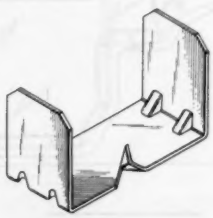
247,211
COMBINED COVER AND DISPENSER FOR A JAR OR THE LIKE
Sidney L. Young, Rte. 1, Delta, Utah 84624
Filed Dec. 8, 1975, Ser. No. 638,470
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—131



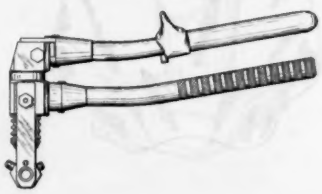
247,212
TOILET BOWL BRUSH
Robert J. Welch, West Chicago, Ill., assignor to Minnesota Mining and Manufacturing Co., St. Paul, Minn.
Filed Jan. 26, 1976, Ser. No. 652,489
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—179



247,213
CAN PUNCTURING TOOL OR SIMILAR ARTICLE
Alfred Nilsen, and James Stewart Calkins, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Filed Aug. 15, 1975, Ser. No. 605,116
The portion of the term of this patent subsequent to Sept. 6, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D8—18



247,214
RIVET GUN
Paul E. Wolf, Box 38C R.F.D., Pascoag, R.I. 02859
Filed Aug. 16, 1976, Ser. No. 716,121
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—51



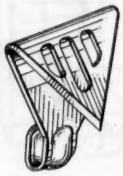
247,215
ROD FOR UNLOCKING AND LOCKING A VEHICLE DOOR
Murray R. Nassau, 9880 W. Bay Harbor Drive, Bay Harbor Island, Fla. 33154
Filed Dec. 20, 1976, Ser. No. 752,552
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—88

247,216
CABLE SUPPORT RACK
Lyle H. Mathews, P.O. Box 3697, Anaheim, Calif. 92803
Filed Aug. 23, 1976, Ser. No. 716,891
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—356

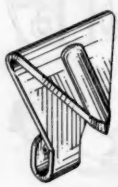
247,217
CAM CLEAT
Carl Alan Merry, Marion, Mass., assignor to Schaefer Marine Products, New Bedford, Mass.
Filed Jan. 27, 1977, Ser. No. 762,835
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—356

247,218
PORTABLE REEL FOR ELECTRIC EXTENSION CABLE
Robert N. Barber, 3705 N. Miller, Oklahoma City, Okla. 73112
Filed Oct. 12, 1976, Ser. No. 731,325
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—359

247,219
ONE PIECE WALL BRACKET WITH SLOTTED WALL PENETRATING PROJECTION
Richard M. Yensh, 1901 E. Missouri, Phoenix, Ariz. 85016
Filed Aug. 9, 1976, Ser. No. 712,527
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—371

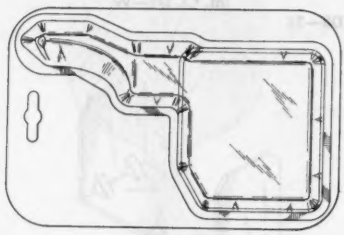


247,220
ONE PIECE WALL BRACKET WITH CORRUGATED WALL PENETRATING PROJECTION
Richard M. Yensh, 1901 E. Missouri, Phoenix, Ariz. 85016
Filed Aug. 9, 1976, Ser. No. 712,529
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—371



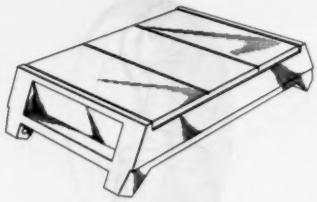
247,221
BOTTLE
Walter Landor, San Francisco, and Richard C. Young, San Rafael, both of Calif., assignors to S. C. Johnson & Son, Inc.
Filed July 16, 1976, Ser. No. 706,083
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—168

247,222
RIBBON CARTRIDGE PACKAGE
Anthony N. Paone, Syracuse, and William P. Montgomery, Cortland, both of N.Y., assignors to SCM Corporation, New York, N.Y.
Filed July 12, 1976, Ser. No. 704,265
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—192



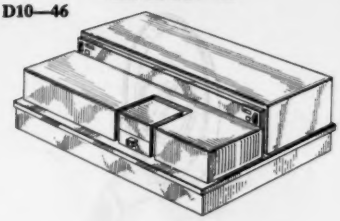
247,223
PANTYHOSE PACKAGE
Barry G. Carroll, Burlington, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.
Filed Apr. 7, 1976, Ser. No. 674,746
Term of patent 14 years
Int. Cl. D9-03
U.S. Cl. D9—193

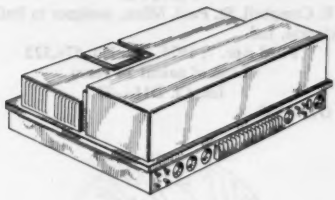
247,224
WRIST WATCH CASE
John Hunter Pemberton, Cambridge, England, assignor to Sinclair Radionics Limited, Huntingdon, England
Filed Oct. 3, 1975, Ser. No. 619,858
Claims priority, application United Kingdom, Apr. 9, 1975, 970574/75
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—38



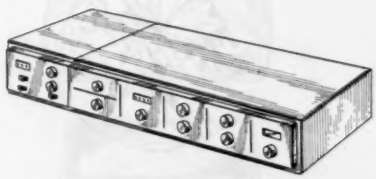
247,225
TOOTH-SHAPED SAND TIMER
Edward K. Beckwith, 303 La Marina, Santa Barbara, Calif. 93109
Filed May 24, 1976, Ser. No. 689,506
Term of patent 14 years
Int. Cl. D10—*03*
U.S. Cl. D10—44

247,226
SPECTROPHOTOFLUOROMETER
James G. Bruni, Glendale; Stephen G. Hauser, Tarzana, both of Calif.; David Lynnwood Lessner, Baltimore, and James Herbert Macemon, Glen Burnier both of Md., assignors to Baxter Travenol Laboratories, Inc.
Filed May 24, 1976, Ser. No. 689,436
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D10—46





247,227
COMPONENT FOR A SPECTROPHOTOFLUOROMETER
James G. Bruni, Glendale; Stephen G. Hauser, Tarzana, both of Calif.; David Lynnwood Lessner, Baltimore, and James Herbert Macemon, Glen Burnie, both of Md., assignors to Baxter Travenol Laboratories, Inc.
Filed May 24, 1976, Ser. No. 689,437
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D10—46



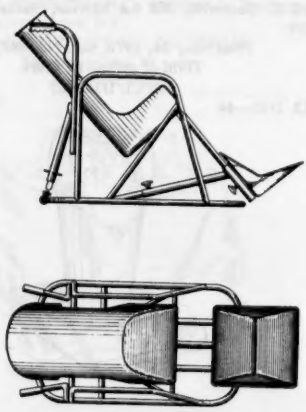
247,228
JEWELRY FINDING
George Viveiros, P.O. Box L-188, New Bedford, Mass. 02745
Filed July 12, 1976, Ser. No. 704,237
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—1

247,229
PLAQUE
William B. Campbell, St. Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Apr. 7, 1976, Ser. No. 674,522
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—135

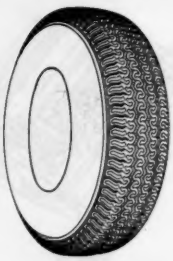
247,230
PLAQUE
William B. Campbell, St. Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Apr. 7, 1976, Ser. No. 674,525
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—137

247,231
MOISTENER STATUETTE
Gorgonio M. Solidum, 56 Vesta St., San Francisco, Calif. 94124; Alan J. Jang, 2920 Octavia St., San Francisco, Calif. 94123, and Thomas Yee, 635 28th Ave., San Francisco, Calif. 94121
Filed May 13, 1976, Ser. No. 685,959
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—160

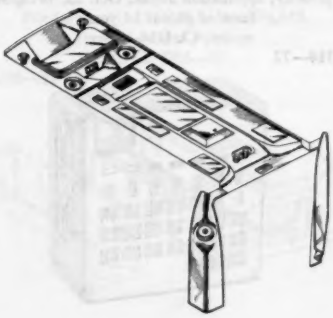
247,232
INVALID'S CHAIR
Robert D. Gunnell, 7768 Waterman Road, Vassar, Mich. 48768
Filed Feb. 25, 1976, Ser. No. 661,058
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D12—54



247,233
VEHICLE TIRE
Norio Iwata, No. 29-1, 2-chome, Onta-Cho, Higashi-Murayama, Tokyo, and Hiroshi Kojima, No. 19-5, 4-chome, Higashi-Toyota, Hino, Tokyo, both of Japan
Filed Feb. 3, 1977, Ser. No. 765,125
Claims priority, application Japan, Sept. 22, 1976, 51-37327
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—143

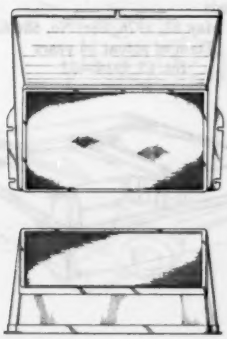


247,234
VAN OVERHEAD CONSOLE
Buster D. Stewart, 16123 Runnymede St., Van Nuys, Calif. 91406
Filed Feb. 9, 1976, Ser. No. 656,415
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155

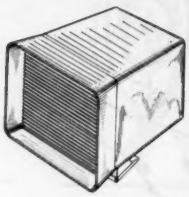


247,235
HAND-HELD MICROPHONE
Paul L. Cote, Windham, N.H., assignor to Gentex Corporation, New York, N.Y.
Filed Mar. 2, 1977, Ser. No. 773,660
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—12

247,236
LOUDSPEAKER
Robert E. Croup, Indianapolis, Ind., assignor to Acoustic Fiber Sound Systems, Inc.
Filed Feb. 9, 1976, Ser. No. 656,151
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—33

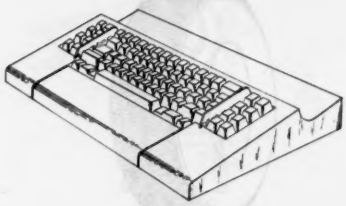


247,237
LOUDSPEAKER
Robert E. Croup, Carmel, Ind., assignor to Acoustic Fiber Sound Systems, Inc., Indianapolis, Ind.
Filed Jan. 29, 1976, Ser. No. 653,341
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—35

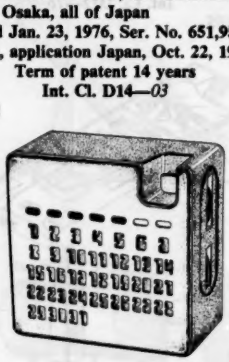


247,238
MODULARIZED HOUSING UNIT FOR ELECTRONIC APPARATUS OR THE LIKE
Helmut Eppich, West Vancouver, and Paul K. L. Dwillies, Delta, both of Canada, assignors to Ebco Industries, Ltd., Richmond, Canada
Filed May 13, 1976, Ser. No. 686,631
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—40

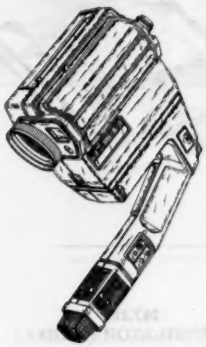
247,239
KEYBOARD
Charles Paul Baechtle, Lake Katrine, and John Van Dyke Stram, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Aug. 2, 1976, Ser. No. 710,831
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—40



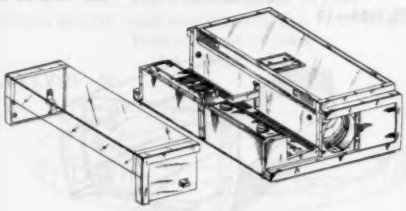
247,240
COMBINED RADIO RECEIVER AND PERPETUAL CALENDAR
Masami Ueda, 6-12 Saidaiji-kita 1-chome, Nara, Nara; Benito Mishiro, C7-403 Shirasagi-danchi 1771, Kanaoka-cho, Sakai, Osaka; Toshio Igo, 3-304 Myoken-zaka 3-chome, Katano, Osaka, and Masanori Hamada, 216 Kotobuki-mansion, 1-95 Kyuhoen, Yao, Osaka, all of Japan
Filed Jan. 23, 1976, Ser. No. 651,955
Claims priority, application Japan, Oct. 22, 1975, 50-42485
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—72



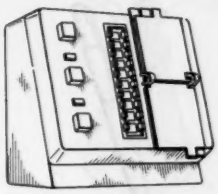
247,241
MOTION PICTURE CAMERA OR THE LIKE
David E. Hansen, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Continuation-in-part of Ser. No. 685,490, May 11, 1976, abandoned. This application Aug. 6, 1976, Ser. No. 712,458
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—04



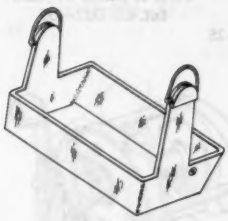
247,242
TRANSPARENCY PROJECTOR
Robert E. Bourke, Weston, Conn., assignor to GAF Corporation, New York, N.Y.
Filed June 11, 1976, Ser. No. 694,945
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D16—21



247,243
SORTER CONTROLLER
John A. Nelson, Pittsford, and Jacob W. Patla, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed May 3, 1976, Ser. No. 682,281
Term of patent 14 years
Int. Cl. D14—*02;* D18—*99*
U.S. Cl. D16—32



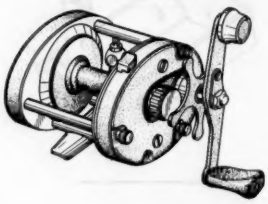
247,244
CAMERA CARRYING DEVICE
Harry E. Mazur, P.O. Box 4508, Palm Springs, Calif. 92262
Filed Aug. 16, 1976, Ser. No. 714,610
Term of patent 14 years
Int. Cl. D16—*05;* D3—*02*
U.S. Cl. D16—44



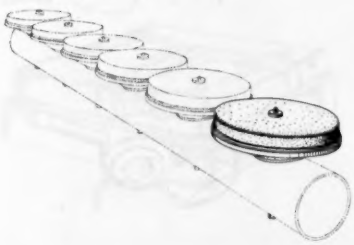
247,245
DUAL VIEWER ATTACHMENT FOR A MICROSCOPE
John T. Armbruster, Niagara Falls, N.Y., assignor to American Optical Corporation, Southbridge, Mass.
Filed Feb. 24, 1976, Ser. No. 660,968
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—83

247,246
WRITING INSTRUMENT
Franco Verona, Turin, Italy, assignor to Aurora S.p.A., Turin, Italy
Filed June 28, 1976, Ser. No. 700,621
Claims priority, application Italy, Jan. 28, 1976, 52884/76
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—45

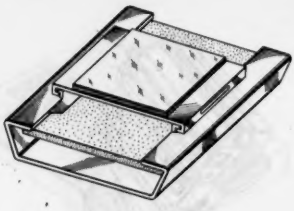
247,247
FISHING REEL
Kiyoshi Okada, Koganei, Japan, assignor to Daiwa Seiko, Inc., Higashikurume, Japan
Filed Aug. 27, 1976, Ser. No. 718,251
Claims priority, application Japan, July 8, 1976, 51-6382
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25



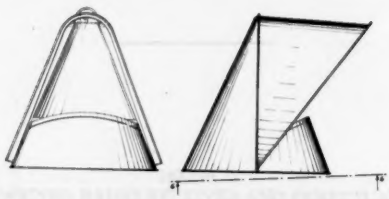
247,248
DIFFUSION PLATE FOR OXYGENATION TREATMENT OF SLUDGE OR THE LIKE
Jean Durot, Villepreux, France, assignor to Degremont S.A., Rueil-Malmaison, France
Filed Mar. 29, 1976, Ser. No. 671,692
Claims priority, application France, Sept. 29, 1975, 1262
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—1



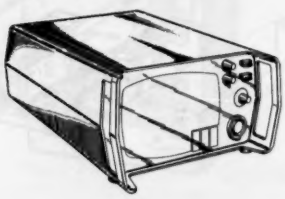
247,249
COMBINED HOLDER AND MOUNTING BRACKET FOR SOLID DEODORANT, PERFUME, INSECT REPELLANT OR THE LIKE
Georg Schimanski, Hagen, Germany, assignor to Globol-Werk GmbH, Neuburg, Germany
Division of Ser. No. 622,630, Oct. 15, 1975, Pat. No. Des. 242,145. This application Aug. 16, 1976, Ser. No. 714,366
Claims priority, application Germany, Apr. 21, 1975, MR 281
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150



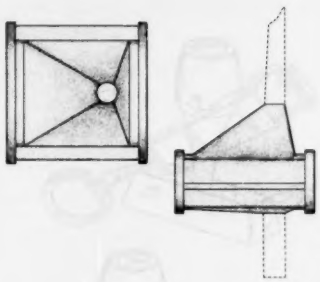
247,250
VENTILATOR HOOD
Lester L. Miller, 3117 De Salvo Road, Jacksonville, Fla. 32216
Filed Aug. 5, 1976, Ser. No. 712,169
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—153



247,251
PORTABLE PHYSIOLOGICAL MONITOR
Joseph D. Napoli, Billerica, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed Oct. 4, 1976, Ser. No. 729,616
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—17

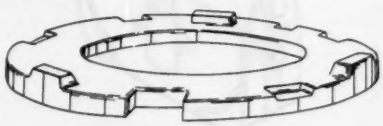


247,252
FILTER ASSEMBLY
David J. Rosenberg, Glen Cove, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.
Filed Feb. 12, 1976, Ser. No. 657,674
Term of patent 14 years
Int. Cl. D23—*99;* D24—*02, 99*
U.S. Cl. D24—52

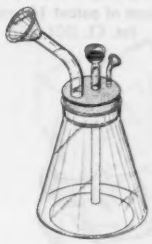


247,253
COMMUNICATIONS BOOTH
John H. Vargo, 110 Second St., Verplanck, N.Y. 10596
Filed July 28, 1976, Ser. No. 709,433
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—16

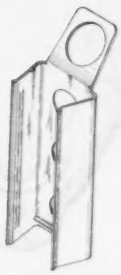
247,254
PRE-CAST CONCRETE UNIT FOR MANHOLES
Brian E. Brown, Burlington, and Alfred G. Hall, London, both of Canada, assignors to Moduloc Concrete Products (London) Ltd., Concorde, Canada
Filed Aug. 9, 1976, Ser. No. 712,824
Claims priority, application Canada, Feb. 9, 1976, 0902762
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—36



247,255
SMOKING PIPE
Charles W. Frost, 1778 A Spanish Trail, Columbia, S.C. 29210
Filed Dec. 2, 1975, Ser. No. 637,044
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—3



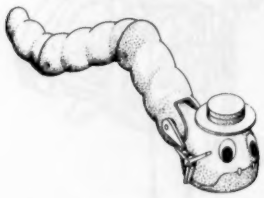
247,256
APPARATUS FOR CARRYING ARTICLES ON A TENNIS RACQUET
Ernest W. Kevin, 2728 60th SE., Mercer Island, Wash. 98040
Filed Nov. 10, 1975, Ser. No. 630,356
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 ST



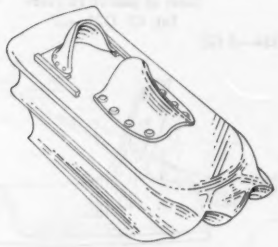
247,257
PUTTER
Roy L. Osborn, P.O. Box 23157, Phoenix, Ariz. 85063
Filed Jan. 12, 1976, Ser. No. 648,576
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GC

247,258
COMBINED FLOATING TOY AND FIGURES THEREFOR
Shinroku Nakao, Yokohama, Japan, assignor to Combi Co., Ltd., Tokyo, Japan
Filed Jan. 5, 1976, Ser. No. 646,700
Claims priority, application Japan, July 15, 1975, 50-29311; July 15, 1975, 50-29310; July 15, 1975, 50-29309
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 B

247,259
TOY MEASURING WORM
Hiroichi Yonezawa, Matsudo, Japan, assignor to Kabushiki Kaisha Yoneya Gangu
Filed Nov. 16, 1976, Ser. No. 742,350
Claims priority, application Japan, July 22, 1976, 51-28160
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 B



247,260
FOOT SKI
Gary Becker Jacobs, 4023 Guadalupe, Austin, Tex. 78751
Filed Sept. 13, 1976, Ser. No. 723,031
Term of patent 7 years
Int. Cl. D21—*02*
U.S. Cl. D34—40

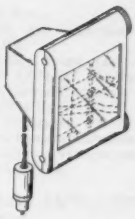


247,261
HAND STAMP
Franz Hörmann, Simoniusstrasse 21, 7988 Wangen Im Allgau, Germany
Filed Dec. 29, 1975, Ser. No. 645,127
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D64—10

247,262
SHOULDER BAG
Thomas D. Tweedie, Monrovia, Calif., assignor to Samsonite Corporation, Denver, Colo.
Filed Dec. 16, 1975, Ser. No. 641,301
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 F

247,263
COMBINED KEY RING AND BOTTLE OPENER
Alberthus van Benthem, 8, Bergkampen, Vollenhoven, Netherlands
Filed Jan. 28, 1976, Ser. No. 653,372
Claims priority, application Benelux, Aug. 1, 1975, 50466-00
Term of patent 14 years
Int. Cl. D3—*01;* D7—*06*
U.S. Cl. D87—8.3

247,264
MAP VIEWER
John N. Smith, Willingboro, N.J., assignor to Interstate Travel Services, Inc., Willingboro, N.J.
Filed Feb. 9, 1976, Ser. No. 656,136
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D96—9



247,265
SIGN STAKE
Robert L. Ledebuhr, 205 E. Aldrich, Capac, Mich. 48014
Filed Sept. 29, 1976, Ser. No. 727,978
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12 A

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 14TH DAY OF FEBRUARY, 1978

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Robins Company, Inc.: *See—*
Cale, Albert Duncan, Jr., 4,073,796, Cl. 260-326.330.

A-Lok Corporation: *See—*
Ditcher, John, 4,073,048, Cl. 29-450.000.

A/S Daloon: *See—*
Trostmann, Erik; and Albertsen, Ove, 4,073,953, Cl. 426-297.000.

A-T-O Inc.: *See—*
Heintz, Clifford E., 4,073,741, Cl. 252-187.00R.

AAGFA-Gevaert, A.G.: *See—*
Zangenfeind, Helmut; Burchardi, Jurgen; and Lederer, Josef, 4,073,588, Cl. 355-41.000.

Abbott Laboratories: *See—*
Guzek, David Thaddeus, 4,073,907, Cl. 424-253.000.

Abdo, Kamal Mohammad: *See—*
Hartdegen, Frank Joseph; and Abdo, Kamal Mohammad, 4,073,884, Cl. 424-94.000.

Abe, Shunji. Rice flavored snack food. 4,073,958, Cl. 426-559.000.

Abendschein, Frederic Henry; Ivey, John Saxon; Roberts, Richard W.; and Tothero, Dwight L., to Borg-Warner Corporation. Variable displacement compressor. 4,073,603, Cl. 417-222.000.

ACEC, Ateliers de Constructions Electriques de Charleroi: *See—*
Dardenne, Regis, 4,074,185, Cl. 324-208.000.

Ackermann, Walter J. Electronic power supply. 4,074,345, Cl. 363-48.000.

Adams, Jac, to Krey Packing Company. Biological process for scrubbing smokehouse smoke. 4,073,686, Cl. 195-2.000.

Adams-Russell Co., Inc.: *See—*
Patterson, William Luther, 4,073,381, Cl. 206-331.000.

Addressograph Multigraph Corporation: *See—*
Westdale, Virgil W.; and Novotny, John, 4,073,980, Cl. 428-404.000.

Adler, Franklin P., to Apex Railway Products Co. Closing means for a hatch cover. 4,073,239, Cl. 105-377.000.

Aeritalia S.p.A.: *See—*
Hapke, Donald W., 4,073,440, Cl. 239-265.290.

Aerojet-General Corporation: *See—*
Beichel, Rudi, 4,073,138, Cl. 60-245.000.

AFGA-Gevaert N.V.: *See—*
Florens, Raymond Leopold, 4,073,652, Cl. 96-101.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
Chaussy, Jacques; Bret, Jean-Louis; Berton, Adrien; and Odin, Jacques, 4,074,343, Cl. 363-14.000.

Agency of Industrial Science and Technology, The President of the: *See—*
Kimura, Minoru; Tango, Hiroyuki; and Ohmori, Yukio, 4,073,055, Cl. 29-583.000.
Torikai, Eiichi; and Kawami, Youji, 4,073,705, Cl. 204-92.000.

Agency of Industrial Science and Technology of Japan: *See—*
Yamaki, Naoomi; Futsuhara, Natsuko; Masuda, Kazue; and Tsuchimoto, Koji, 4,073,866, Cl. 423-405.000.

AGFA-Gevaert, A.G.: *See—*
Lermann, Peter, 4,073,582, Cl. 352-141.000.
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Hankee, Roy H.; and Akman, Alp T., 4,074,000, Cl. 428-323.000.

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Margen, Peter Heinrich Erwin; Grimstedt, Harry Evert; and Bosaeus, Jan Anders, 4,073,045, Cl. 29-157.30C.

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Schwartz, Osten, 4,073,031, Cl. 15-373.000.

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Garab, H. Gary, 4,073,414, Cl. 222-602.000.

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Trostmann, Erik; and Albertsen, Ove, 4,073,953, Cl. 426-297.000.

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Tuller, Harold W.; and Nussbaum, Ralph W., 4,074,036, Cl. 526-238.000.

Allington, Robert William, to Instrumentation Specialties Company. Temperature compensated optical measuring instruments. 4,073,182, Cl. 73-1.00R.

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Philpot, Marvin J., 4,073,347, Cl. 172-710.000.
Flate, John R.; and Lucas, James H., 4,073,200, Cl. 74-501.00R.

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Papafingos, Pandelis N.; and Lance, Richard T., 4,073,644, Cl. 75-68.00R.

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Kinosz, Donald L.; and Haupin, Warren E., 4,073,703, Cl. 204-70.000.
Lewis, Paul R., 4,073,399, Cl. 215-254.000.

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Kiuchi, Mitsuyuki; Amagami, Keizo; Mizukawa, Takumi; and Kominami, Hideyuki, 4,074,101, Cl. 219-10.49R.

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Fujikake, Kenji; Amaki, Isamu; and Suzuki, Masatoshi, 4,073,338, Cl. 165-86.000.

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Knudsen, Kenneth F., 4,073,238, Cl. 104-172.00S.

American Cyanamid Company: *See—*
Bullock, Milon Walker; and Walworth, Bryant Leonidas, 4,074,059, Cl. 560-135.000.
Mohan, Arthur Gaudens, 4,074,046, Cl. 542-439.000.

Panzer, Hans Peter; O'Connor, Michael Niall Desmond; and Baccei, Louis J., 4,074,055, Cl. 548-347.000.
Schaub, Robert Eugene; Bernady, Karel Francis; and Weiss, Martin Joseph, 4,074,056, Cl. 560-51.000.

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Sakuma, Kotoku, 4,074,271, Cl. 343-882.000.

American Home Products Corporation: *See—*
Janin, Pierre R., 4,073,693, Cl. 195-103.50K.

American Medical Systems, Inc.: *See—*
Bradley, William E.; and Gates, Geoffrey Steven, 4,073,287, Cl. 128-2.00R.

American Optical Corporation: *See—*
Deeg, Emil W.; and Krohn, David A., 4,073,579, Cl. 351-169.000.

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Kuhn, Martin C.; Stephens, John A.; Noakes, Michael J.; and Rovig, Allen D., 4,073,479, Cl. 266-173.000.

Andersen 2000, Inc.: *See—*
Brady, Jack D.; and Graves, Kenny M., 4,073,631, Cl. 55-97.000.

Anderson, Arnold L., to Velsicol Chemical Corporation. Plastic compositions. 4,073,772, Cl. 260-45.75B.

Anderson, Bror E.: *See—*
Schick, Margery L.; and Anderson, Bror E., 4,074,003, Cl. 428-341.000.

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Portnoy, Norman A.; and Anderson, David Paul, 4,073,660, Cl. 106-311.000.

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Anderson, John Alfred, to British Gas Corporation. Coal gasification plant. 4,073,627, Cl. 48-62.00R.

Anderson, Lyle V.: *See—*
Knight, Clifford J., 4,074,010, Cl. 428-422.000.

Androski, Edward C. Remote-controlled safety hook assembly. 4,073,531, Cl. 294-83.00R.

Angarola, Barry R.; and Robbins, James A., to Signode Corporation. Dunnage bag fill valve device with integral combination baffle, plug-retainer, and bladder separator. 4,073,389, Cl. 214-10.50D.

Angelotti, Norma. Human mouth model for speech therapy. 4,073,071, Cl. 35-35.00R.

Anglo-Transvaal Consolidated Investment Company Limited: *See—*
Pittie, Willem Hubert; and Overbeek, Gerhardus, 4,073,709, Cl. 204-113.000.

Anhalt, John W.; Goodman, David S.; and Peterson, Carl W., to International Telephone and Telegraph Corporation. Electrical connector. 4,073,560, Cl. 339-99.00R.

Annen, Klaus: *See—*
Hofmeister, Helmut; Laurent, Henry; Wiechert, Rudolf; Annen, Klaus; and Steinbeck, Hermann, 4,073,900, Cl. 424-243.000.

Ansafone Limited: *See—*
Humm, Arthur James, 4,074,081, Cl. 179-84.00R.

Aoyama, Syunichi; and Nakajima, Yasuo, to Nissan Motor Company, Limited. System to feed exhaust gas into the intake manifold. 4,073,202, Cl. 74-860.000.

Apex Railway Products Co.: *See—*
Adler, Franklin P., 4,073,239, Cl. 105-377.000.

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Wretlind, Karl Arvid Johannes; Ljungberg, Stellan; Hakansson, Ivan; and Ajaxon, Bengt Magnus, 4,073,943, Cl. 424-358.000.

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Rousseau, Paul E., 4,073,107, Cl. 52-235.000.

Applied Fiberoptics, Inc.: *See—*
Kloots, Jacobus, 4,073,050, Cl. 29-450.000.

Applied Magnetics, Inc.: *See—*
Davis, Walter L.; and Svehaug, Henry V., 4,073,041, Cl. 17-71.000.

Appollon Designs, Inc.: *See—*
Dale, Richard, 4,073,460, Cl. 248-441.00R.

Aquino, Florencio P.: *See—*
Rabin, Harry H.; and Aquino, Florencio P., 4,073,074, Cl. 36-104.000.

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Yasujima, Nobuo; Arai, Juichiro; Itokawa, Natsuo; and Okino, Katsumoto, 4,073,971, Cl. 427-103.000.

Arakawa, Tadaoki: *See—*
Hashimoto, Kametaro; Ushitani, Kenji; Serino, Yoichi; and Arakawa, Tadaoki, 4,073,474, Cl. 251-368.000.

Arakawa, Tamio, to Teijin Limited. Deep-drawing of a monoaxially oriented, heat relaxed polyester film. 4,073,857, Cl. 264-291.000.

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Yotsuyanagi, Yoshihiko; Araki, Naganori; Nagasawa, Shigeru; and Okitsu, Toshinao, 4,073,756, Cl. 260-18.00N.

Archibald, John Leheup; and Jackson, John Lambert, to John Wyeth & Brother Limited. Piperidino ureas and thioureas. 4,073,790, Cl. 260-293.730.

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Ark-Les Switch Corporation: *See—*
Leaf, Harry Vincent; and Cassidy, Francis J., 4,074,065, Cl. 174-87.000.

Armasow, Waldemar; and Lindenthal, Hans, to Voith Getriebe KG. Hydrodynamic coupling. 4,073,139, Cl. 60-357.000.

Armstrong Cork Company: *See—*
Buckwalter, Mervin R.; and Knaub, Edgar W., 4,073,975, Cl. 427-170.000.
Dieck, Ronald L.; and Quinn, Edwin J., 4,073,824, Cl. 260-823.000.
Dieck, Ronald L.; and Quinn, Edwin J., 4,073,825, Cl. 260-824.00R.

Armstrong, David L.: *See—*
Gupta, Rash B.; and Armstrong, David L., 4,074,357, Cl. 364-494.000.

Arndt, Friedrich; and Nusslein, Ludwig, to Schering Aktiengesellschaft. 5-Alkylureido-1,3,4-thiadiazol-2-yl-sulfonyl-acetic acid derivatives. 4,073,793, Cl. 260-306.80D.

Arndt, Henry Clifford: *See—*
Woessner, Warren Dexter; Sih, Charles John; Kluender, Harold Clinton; Arndt, Henry Clifford; and Biddlecom, William Gerard, 4,074,063, Cl. 560-121.000.

Arneth, Reinhold; and Schwandt, Rudi, to Hoechst Aktiengesellschaft. Apparatus for developing a latent electrostatic image on an electrophotographic copying material. 4,073,266, Cl. 118-647.000.

Arnold, Franz; Boehm, Oscar; and Cenaruzza, Ignacio. Mechanical power amplifier, in particular for a machine vise. 4,073,197, Cl. 74-110.000.

Aronson, Robert R., to Electric Fuel Propulsion Corporation. High discharge battery with depolarized plates. 4,074,021, Cl. 429-51.000.

Arrowood, Gordon W., to McKenney's, Inc. Internal back vent system. 4,073,018, Cl. 4-191.000.

Arshansky, Mikhail Iosipovich: *See—*
Korshunov, Evgeny Alexeevich; Bainov, Nikolai Ivanovich; Petrov, Igor Nikolaevich; Konovalov, Georgy Fedorovich; Arshansky, Mikhail Iosipovich; Shmidt, Petr Genrikhovich; Kostrov, Valery Pavlovich; and Efremov, Petr Evgenievich, 4,073,333, Cl. 164-66.000.

Artel Manufacturing Corporation: *See—*
Hurney, Paul A.; and Curtis, John P., 4,074,310, Cl. 358-84.000.

Asaeda, Toshio; Suzuki, Ikuo; Imai, Tomoyasu; Kitajima, Masato; and Hota, Kazunori, to Toyoda-Koki Kabushiki-Kaisha; and Asaeda, Toshio. Truing and dressing apparatus for grinding wheels. 4,073,281, Cl. 125-11.0CD.

Asahi Denka Kogyo K.K.: *See—*
Soga, Mitsuo; Takase, Yuuzo; Ishikawa, Manabu; Nakazawa, Masahiko; and Nakayama, Mutumi, 4,074,034, Cl. 526-56.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Doi, Tsunesuke; Komoto, Hiroshi; Chono, Masazumi; Inoue, Akira; Saito, Kazuaki; and Shinozuka, Isao, 4,073,618, Cl. 21-2.70R.
Matsuo, Shunji; Sasaguri, Kiichiro; Nakamura, Katsuyuki; Matsumoto, Yoshio; and Sato, Mikio, 4,073,775, Cl. 260-47.0EP.

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Nobusawa, Tsukumo, 4,074,289, Cl. 354-23.00D.

Asahina, Yasuo: *See—*
Imai, Kiyoshi; Hasebe, Nobuyuki; Asami, Tomiaki; Soga, Setsuo; Fukushima, Ichiro; and Asahina, Yasuo, 4,074,001, Cl. 428-329.000.

Asai, Kiyokazu; and Takeuchi, Akihiro, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Ultrasonic wave generator. 4,074,152, Cl. 310-334.000.

Asami, Tomiaki: *See—*
Imai, Kiyoshi; Hasebe, Nobuyuki; Asami, Tomiaki; Soga, Setsuo; Fukushima, Ichiro; and Asahina, Yasuo, 4,074,001, Cl. 428-329.000.

Asano, Koichi: *See—*
Kumai, Ko; Asano, Koichi; and Bando, Hideharu, 4,073,643, Cl. 75-49.000.

Asen, Donald. Microwave oven rack. 4,074,102, Cl. 219-10.55E.

Ashcroft, Geoffrey Laurence: *See—*
Heinecke, Rudolf August Herbert; and Ashcroft, Geoffrey Laurence, 4,073,669, Cl. 156-643.000.

Astra Lakemedel Aktiebolag: *See—*
Lindberg, Ulf Henrik Anders; Ross, Svante Bertil; Thorberg, Seth Olov; and Ogren, Sven Ove, 4,073,941, Cl. 424-324.000.
Sandberg, Rune Verner; and Akerman, Sven Bengt Arvid, 4,073,917, Cl. 424-267.000.

Atencio, Francisco Jose Gutierrez. Submersible diffuser. 4,073,146, Cl. 61-19.000.

Athenes, Claude: *See—*
Charransol, Pierre; Hauri, Jacques; and Athenes, Claude, 4,074,077, Cl. 179-15.0AT.

Atlantic Richfield Company: *See—*
Airhart, Tom P., 4,073,362, Cl. 181-117.000.
Airhart, Tom P., 4,073,363, Cl. 181-117.000.

Atlas Copco Aktiebolag: *See—*
Eklof, Ake Torsten; Fengsborn, Per Tage Allan; and Romell, Gunnar Vigg Riss, 4,073,350, Cl. 173-139.000.

Atsukawa, Masumi; Ushio, Hiroyuki; Kuwabara, Haruo; and Kubo, Kyoji, to Mitsubishi Jukogyo Kabushiki Kaisha. Method of desulfurizing exhaust emission using pulverized slag as absorbent. 4,073,864, Cl. 423-242.000.

Auberry, Horace: *See—*
Liebscher, Anton; Oberg, Sven; Smathers, Kenneth; and Auberry, Horace, 4,073,023, Cl. 12-142.0RS.

Auburn International, Inc.: *See—*
Dechene, Ronald L.; Grimaldi, Frank G.; and Newton, Robert E., 4,074,184, Cl. 324-30.00R.

Avdeef, John A. Electronic torque wrench. 4,073,187, Cl. 73-139.000.

Avicola, Kenneth, to Jersey Nuclear-Avco Isotopes, Inc. System for increasing laser pulse rate with beam splitters. 4,073,572, Cl. 350-174.000.

AVM Corporation: *See—*
Sheppard, William L., 4,073,465, Cl. 251-58.000.

Axen, Udo F., to Upjohn Company, The. Triphenylphosphonium bromide intermediate for 2,2-fluoro-PG analogs. 4,073,803, Cl. 260-515.00A.

Aylmer, Norman Noel; Coe, Peter; Watson, John Graham; and Holloway, Brian Percy, to Piccal Subsea Limited. Offshore method. 4,073,157, Cl. 61-111.000.

Azar, David: *See—*
Lowry, James M.; and Azar, David, 4,073,759, Cl. 260-28.5AS.

Azuma, Toshihiro: *See—*
Ohtani, Naoteru; Koyama, Tutomu; Takeuchi, Takashi; Azuma, Toshihiro; and Matsuda, Morio, 4,073,658, Cl. 106-92.000.

B. F. Goodrich Company, The: *See—*
Ramp, Floyd Lester, 4,073,752, Cl. 260-2.10R.
Son, Pyong-Nae; and Layer, Robert Wesley, 4,073,770, Cl. 260-45.8NW.

Baatz, James C.; and Donermeyer, Donald D., to Monsanto Company. Acid modified polyvinyl acetate textile sizes. 4,073,994, Cl. 428-265.000.

Baatz, James C.; and Donermeyer, Donald D., to Monsanto Company. Acid modified polyvinyl acetate textile sizes. 4,073,995, Cl. 428-265.000.

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Baccei, Louis J.: *See—*
Panzer, Hans Peter; O'Connor, Michael Niall Desmond; and Baccei, Louis J., 4,074,055, Cl. 548-347.000.

Bacon, David C.: *See—*
DeLorean, Jack Z.; and Bacon, David C., 4,074,117, Cl. 235-92.00T.

Bader, Clifford John, to Burroughs Corporation. System for rotating small permanent magnets while adjusting and simultaneously sensing the magnetic moments thereof. 4,074,197, Cl. 324-205.000.

Bailey, August V.; Boudreaux, Gordon J.; Sumrell, Gene; and Novak, Arthur F., to United States of America, Agriculture. Antimicrobial esters of aliphatic diols. 4,074,058, Cl. 560-105.000.

Bailey, Frank Gordon; and Ralphs, George Trevor, to C. & J. Clark Ltd. Manufacture of shoes. 4,073,022, Cl. 12-135.00A.

Bailey, James R.; and Lavigne, Vernon W., to Switchcraft, Inc. Structure for electrical connections and panel assembly. 4,073,563, Cl. 339-128.000.

Bainov, Nikolai Ivanovich: *See—*
Korshunov, Evgeny Alexeevich; Bainov, Nikolai Ivanovich; Petrov, Igor Nikolaevich; Konovalov, Georgy Fedorovich; Arshansky, Mikhail Iosipovich; Shmidt, Petr Genrikhovich; Kostrov, Valery Pavlovich; and Efremov, Petr Evgenievich, 4,073,333, Cl. 164-66.000.

Baker, Daniel, deceased (by Fuhrer, Esther Claire): and Borst, Alan W. Magnetic propulsion device. 4,074,153, Cl. 310-12.000.

Baker Perkins Holdings Limited: *See—*
Glover, William, 4,073,116, Cl. 53-182.00R.

Baker, Roger T. Memory cell with nondestructive recall. 4,074,239, Cl. 365-176.000.

Baker, William H., to Paddock Industries, Inc. Roofing system for large-area building structures. 4,073,098, Cl. 52-66.000.

Balas, Charles, Jr.; Lou, David Yuan Kong; and Kenney, George Churchill, II, to North American Philips Corporation. Radiation-sensitive record with protected sensitive surface. 4,074,282, Cl. 346-135.000.

Balasubramanyan, Sugavanam; Shephard, Margaret Claire; and Crowley, Patrick Jelf, to Imperial Chemical Industries Limited. Fungicidally effective imidazoles and use thereof against fungal pests. 4,073,923, Cl. 424-273.00R.

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Balderson, Robert Bruce. Audible-visual warning alarm system. 4,074,244, Cl. 340-244.00R.

Ball Corporation: *See—*
Scholes, Addison B.; and Dollar, David L., 4,073,966, Cl. 427-26.000.

Ballman, Albert Anthony; Brown, Harold; Martin, John Martin; and Tien, Ping King, to Bell Telephone Laboratories, Incorporated. Waveguiding epitaxial $LiNbO_3$ films. 4,073,675, Cl. 156-600.000.

Bando, Hideharu: *See—*
Kumai, Ko; Asano, Koichi; and Bando, Hideharu, 4,073,643, Cl. 75-49.000.

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Baraff, David Robbin; Boynton, Robert James; and Livermore, Frederick Caldwell, to Northern Telecom Limited. Thermal print bar. 4,074,109, Cl. 219-216.000.

Barakitis, Nikolaos: *See—*
Webb, Edward A.; Barakitis, Nikolaos; and Pigott, Keith, 4,074,166, Cl. 313-185.000.

Baranowski, Conrad J. Method for forming a heat sink and connector device and the product thereof. 4,073,561, Cl. 339-112.00R.

Barleon, Leopold; Dorner, Stefan; Goetzmann, Odo; and Kussmaul, Guenter, to Gesellschaft fuer Kernforschung. Nuclear reactor core catching apparatus. 4,073,682, Cl. 176-38.000.

Barlow, Gordon A., to Marvin Glass & Associates. Phonograph device. 4,073,496, Cl. 274-9.00B.

Barnhart, David A.; and Loftin, Gordy E., to Celotex Corporation, The. Fan housing assembly. 4,073,597, Cl. 415-201.000.

Barnickel, Heinrich; Sigl, Winfrid; and Schwable, Jorg, to Boehringer Ingelheim GmbH. Granulating process. 4,073,838, Cl. 264-37.000.

Baron, William James, to Western Electric Company, Inc. Method of selectively depositing metal on a surface. 4,073,981, Cl. 427-259.000.

Barr, Harold N., to Nuclear Battery Corporation. Microwatt thermoelectric generator. 4,073,665, Cl. 136-202.000.

Barrett, Jon S. Instant electronic camera. 4,074,324, Cl. 358-296.000.

Barton, Sterling C.: *See—*
Carson, Chester C.; Barton, Sterling C.; and Echeverria, Federico S., 4,074,137, Cl. 250-380.000.

Bartrug, Norman G.; and McDaniel, Donald L., to PPG Industries, Inc. Process for forming elastomer films. 4,073,849, Cl. 264-236.000.

Bartsch, Raymond C.: *See—*
Lerman, Frank; and Bartsch, Raymond C., 4,073,992, Cl. 428-207.000.

BASF Aktiengesellschaft: *See—*
Eisert, Manfred; and Schmeidl, Karl, 4,074,060, Cl. 560-149.000.
Hack, Joachim; Schaefer, Dieter; and Motz, Herbert, 4,074,002, Cl. 428-331.000.
Koester, Eberhard; Wunsch, Gerd; Schoenafinger, Eduard; and Schneehage, Hans Henning, 4,073,977, Cl. 427-216.000.
Ladenberger, Volker; Bronstert, Klaus; Hovemann, Friedrich; and Simak, Petr, 4,073,738, Cl. 252-56.00R.
Naarmann, Herbert; Penzien, Klaus; and Gausepohl, Hermann, 4,074,032, Cl. 526-44.000.
Oeder, Dieter; Gropper, Hans; and Urban, Friedrich, 4,074,040, Cl. 526-352.000.
Scheffel, Dieter; and Richter, Volker, 4,073,262, Cl. 118-52.000.

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Bastian, Robert Edward, to North American Philips Corporation. Device for chopping an optical beam. 4,073,576, Cl. 350-273.000.

Batcho, Andrew David; Hengartner, Urs Oskar; Leimgruber, Willy; Scott, John William; and Valentine, Donald, Jr., to Hoffmann-La Roche Inc. Synthesis of tryptophans. 4,073,795, Cl. 260-326.14T.

Bates, Calvin Dwight, to United States of America, Army. Dielectric substrate for slow-wave structure. 4,074,211, Cl. 333-31.00R.

Bates, Charles F., II. Mechanism for converting predetermined alternate rotational movements to rectilinear movements. 4,073,167, Cl. 70-133.000.

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Battershell, Robert D.: *See—*
Holm, Robert E.; and Battershell, Robert D., 4,073,637, Cl. 71-94.000.

Batts, John H.; and Duester, Everett L., to John Thomas Batts, Inc. Article suspension device. 4,073,457, Cl. 248-340.000.

Bauknecht Gesellschaft mit beschrankter Haftung Elektrotechnische Fabriken: *See—*
Mergner, Dietrich; and Stege, Heinz, 4,073,987, Cl. 428-81.000.

Baum, Werner, to Pei, Inc. Burners for flame jet drill. 4,073,351, Cl. 175-14.000.

Baumgartner, Werner; and Schnoeller, Manfred, to Siemens Aktiengesellschaft. Technique for making silicon U-shaped members. 4,073,859, Cl. 264-322.000.

Baus, Heinz Georg. Lower guide member for adjacently suspended, slideable partitions for a wet chamber. 4,073,035, Cl. 16-96.00R.

Bausch & Lomb Incorporated: *See—*
Dey, Thomas W., 4,074,126, Cl. 362-297.000.

Baxter Travenol Laboratories, Inc.: *See—*
Kehm, Walter C., 4,073,886, Cl. 260-112.00B.

Bay Mills Limited: *See—*
O'Connor, Terence James, 4,073,998, Cl. 428-310.000.

Bayer Aktiengesellschaft: *See—*
Buchel, Karl Heinz; Frohberger, Paul-Ernst; and Kaspers, Helmut, 4,073,901, Cl. 424-245.000.
Buysch, Hans-Josef; Oertel, Harald; and Roos, Ernst, 4,073,746, Cl. 252-404.000.
Dultgen, Gerd; and Schmidt, Wolfgang, 4,073,841, Cl. 264-46.600.
Eimers, Erich; Margotte, Dieter; Schmid, Helmut; and Dhein, Rolf, 4,073,769, Cl. 260-45.80R.
Fest, Christa; Hammann, Ingeborg; and Homeyer, Bernhard, 4,073,893, Cl. 424-200.000.
Hemmerich, Heinz-Peter; Winter, Gerhard; Rosenkranz, Hans Jurgen; and Woditsch, Peter, 4,073,764, Cl. 260-37.00N.
Moretto, Hans-Heinrich; de Montigny, Armand; Thom, Karl-Friedrich; and Schliebs, Reinhard, 4,073,801, Cl. 260-448.20E.
Regel, Erik; Eue, Ludwig; and Schmidt, Robert R., 4,073,636, Cl. 71-92.000.
Schmidt, Manfred; Freitag, Dieter; Fries, Hermann; and Esch, Erich, 4,073,757, Cl. 260-19.00R.

Bayless, Robert G., to Capsulated Systems, Incorporated. Process of feeding larval marine animals. 4,073,946, Cl. 426-2.000.

Baylis, Arthur: *See—*
Grundstrom, Robert Ronnie; and Baylis, Arthur, 4,073,165, Cl. 70-371.000.

Bayliss, John Patrick, to Girling Limited. Anti-skid vehicle braking system. 4,073,546. Cl. 303-115.000.

Bazilova nee Sverinova, Hedvika: *See—*
Lim, Drahoslav; Kopecek, Jindrich; Bazilova nee Sverinova, Hedvika; and Vacik, Jiri, 4,074,039, Cl. 526-303.000.

BBC Brown Boveri & Company Limited: *See—*
Haditsch, Werner; Rutz, Hansruedi; and Toplak, Ernst, 4,074,155, Cl. 310-59.000.
Koch, Hans, 4,073,134, Cl. 60-39.290.

Beach, Bruce M. Pocket-size electronic device for playing chess. 4,073,067, Cl. 35-8.00R.

Beale, Alvin Francis, Jr., to Dow Chemical Company, The. Method for magnesium production using tungsten or molybdenum. 4,073,704, Cl. 204-70.000.

Beck, Theodor; and Gross, Friedrich, to Plate Kofasil Gesellschaft mit beschrankter Haftung. Method for preventing aerobic decomposition processes in fermentated fodder. 4,073,889, Cl. 424-164.000.

Beckman Instruments, Inc.: *See—*
Way, Allan S.; Glenn, Thomas J.; Sloane, Howard J.; and Keahl, Gerald T., 4,074,272, Cl. 346-33.00A.

Bedenk, William Thomas; and Sagel, Paul Joseph, to Procter & Gamble Company, The. Fabric treating articles and processes. 4,073,996, Cl. 428-274.000.

Beecham Group Limited: *See—*
Dowrick, John Sidney, 4,073,920, Cl. 424-271.000.

Beekenkamp, Gerald, to Black and Decker Manufacturing Company, The. Portable workbench assembly. 4,073,484, Cl. 269-321.0CF.

Begin, Louis E.; and Dunbar, Joseph E., to Dow Chemical Company, The. Antithrombotic 1,3,4-thiadiazole. 4,074,049, Cl. 544-82.000.

Behr, Hans. Mixing and/or dispersing and spraying arrangement. 4,073,436, Cl. 239-8.000.

Beichel, Rudi, to Aerojet-General Corporation. Mixed mode rocket engine. 4,073,138, Cl. 60-245.000.

Belanger, Raymond Francis, to Graphic Systems, Inc. Photocomposing machine with movable character storage and presentation apparatus. 4,074,285, Cl. 354-15.000.

Belden Corporation: *See—*
Orlandi, John F.; and Rauch, John E., 4,073,127, Cl. 57-58.360.

Bell & Howell Company: *See—*
Scheib, Harold A., 4,073,589, Cl. 355-50.000.

Bell, Richard M. Sprocket mold. 4,073,463, Cl. 249-102.000.

Bell Telephone Laboratories, Incorporated: *See—*
Albarino, Robert Vincent; and Torza, Sergio, 4,073,974, Cl. 427-163.000.
Ballman, Albert Anthony; Brown, Harold; Martin, John Martin; and Tien, Ping King, 4,073,675, Cl. 156-600.000.
Blake, Roy Baxter, Jr.; Gwatkin, James deGoulard, III; Magee, Judy Pat; and Porter, Glendon Russell, 4,074,087, Cl. 179-170.200.
Caputo, Salvatore; Fitch, Scott McDowell; Harris, Cliff Andrew; Kuhar, John, Jr.; Pappas, Andrew Leo; and Redlich, Wayne, 4,074,358, Cl. 364-514.000.
Christensen, Carl; Hause, Arthur Dickson; and McDonald, Henry Stanton, 4,074,072, Cl. 179-15.0AQ.
Falconer, David Duncan; and Weinstein, Stephen Brant, 4,074,086, Cl. 179-170.200.
Goldschmidt, Wilbur Harry; Henning, Hansjuergen Hermann; and Kapes, William John, Jr., 4,074,319, Cl. 358-230.000.
Hamming, Richard Wesley; and Kaiser, James Frederick, 4,074,212, Cl. 333-70.00T.
Hartless, Ray Lawson; and Trozzolo, Anthony Marion, 4,073,771, Cl. 260-45.9NC.
Johnston, Wilbur Dexter, Jr.; and Shay, Joseph Leo, 4,074,305, Cl. 357-67.000.
Kapes, William John, Jr., 4,074,318, Cl. 358-230.000.
Kapes, William John, Jr., 4,074,320, Cl. 358-230.000.
Prell, Edward Myron; and Rogers, Barry William, 4,074,079, Cl. 179-6.30R.

Belser, Karl Arnold; and Metz, Philip Bradshaw, to International Business Machines Corporation. XY Addressable and updateable compressed video refresh buffer for digital TV display. 4,074,254, Cl. 340-324.0AD.

Belshaw Brothers, Inc.: *See—*
Brown, Amos J.; Belshaw, Thomas E.; Knull, Kenneth L.; and Wilke, Wilbur D., 4,073,305, Cl. 137-140.000.

Belshaw, Thomas E.: *See—*
Brown, Amos J.; Belshaw, Thomas E.; Knull, Kenneth L.; and Wilke, Wilbur D., 4,073,305, Cl. 137-140.000.

Belyaeva, Regina Valentinovna: *See—*
Slezinger, Isaak Isaevich; Babkin, Gennady Fedotovich; Gorlin, Samuil Matusovich; and Belyaeva, Regina Valentinovna, 4,073,188, Cl. 73-147.000.

Benda, David; and Reigel, Franklin G., to GTE Sylvania Incorporated. Cathode ray tube fabricating process. 4,073,558, Cl. 316-18.000.

Benda, Hansjochen; and Huber, Peter, to Siemens Aktiengesellschaft. Semiconductor rectifier device. 4,074,303, Cl. 357-33.000.

Bendix Corporation, The: *See—*
Hall, Roger D., 4,074,347, Cl. 363-158.000.

Benjamin, John Stanwood: *See—*
Volin, Timothy Earl; Benjamin, John Stanwood; Larson, Jay Michael; and Cairns, Robert Lacock, 4,073,648, Cl. 75-245.000.

Bennett, Richard Nelson, to National Instrument Company, Inc. High-speed filling machine. 4,073,322, Cl. 141-169.000.

Beny, Janos; Ryan, John W.; and Snyder, Edward, III, to Ideal Toy Corporation. Toy doll. 4,073,088, Cl. 46-265.000.

Berg, Gerhard; and Nordsiek, Karl-Heinz, to Chemische Werke Huels Aktiengesellschaft. Pulverulent, tackfree, pourable, filler-containing elastomer mixtures optionally containing plasticizer oil, as well as processes for their production and utilization. 4,073,755, Cl. 260-17.4BB.

Berger, Bernard, to Morse Electro Products Corporation. Automatic stop system for a tape recorder. 4,074,327, Cl. 360-74.000.

Berger, Rainer: *See—*
Wiest, Hubert; Berger, Rainer; and Lieb, Erwin, 4,073,779, Cl. 260-79.3MU.

Bergersen, Earl Olaf. Closely adapted orthodontic appliance. 4,073,061, Cl. 32-14.00B.

Berggren, Lloyd E. Apparatus for repressurizing tennis balls. 4,073,120, Cl. 53-79.000.

Beriger, Ernst, to Ciba-Geigy Corporation. Method of controlling insects using 1,3-dioxin-4-ones. 4,073,932, Cl. 424-279.000.

Berkovitz, Robert Abraham; and Gundry, Kenneth James, to Dolby Laboratories, Inc. Stereophonic sound system particularly useful in a cinema auditorium. 4,074,083, Cl. 179-100.1TD.

Berkowitz, Sidney: *See—*
Meadow, Morton; and Berkowitz, Sidney, 4,073,868, Cl. 423-443.000.

Bermudez, Eduardo. Fence structure. 4,073,478, Cl. 256-27.000.

Bernady, Karel Francis: *See—*
Schaub, Robert Eugene; Bernady, Karel Francis; and Weiss, Martin Joseph, 4,074,056, Cl. 560-51.000.

Berrebi, Claudine: *See—*
Bouillon, Claude; and Berrebi, Claudine, 4,073,898, Cl. 424-233.000.

Berton, Adrien: *See—*
Chaussy, Jacques; Bret, Jean-Louis; Berton, Adrien; and Odin, Jacques, 4,074,343, Cl. 363-14.000.

Bertram, Heidrun; Fahnenstich, Rudolf; Offermanns, Heribert; and Tanner, Herbert, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Fodder for cows. 4,073,945, Cl. 426-2.000.

Bethlehem Steel Corporation: *See—*
Steinbicker, Richard N.; and Rauch, Stewart E., 4,073,701, Cl. 204-54.00R.
Wieland, George E., Jr.; and Rudzki, Eugene M., 4,073,668, Cl. 148-113.000.

Biaggini, Benjamin F.; and Garin, Paul V., to Southern Pacific Transportation Company. Lift truck with attachment for carrying automobiles. 4,073,394, Cl. 214-145.00R.

Bickel, Hans: *See—*
Scartazzini, Riccardo; and Bickel, Hans, 4,073,902, Cl. 424-246.000.

Biddlecom, William Gerard: *See—*
Woessner, Warren Dexter; Sih, Charles John; Kluender, Harold Clinton; Arndt, Henry Clifford; and Biddlecom, William Gerard, 4,074,063, Cl. 560-121.000.

Bierlich, Johannes Harald. Ventilators. 4,073,224, Cl. 98-41.00R.

Bills, Marius W. Lock for sliding doors. 4,073,517, Cl. 292-60.000.

Bimba, Charles W. Fluid power motor with guard cylinder. 4,073,219, Cl. 92-128.000.

Birum, Gail H., to Monsanto Company. Hydrogen phosphonates and polymers containing them as flame retardants. 4,073,767, Cl. 260-45.80R.

Bischof, John F.; and Fritsch, Ronald J., to Cutler-Hammer, Inc. Interlocking operating mechanism for enclosed switchgear having defeater interlock. 4,074,091, Cl. 200-50.00A.

Black and Decker Manufacturing Company, The: *See—*
Beekenkamp, Gerald, 4,073,484, Cl. 269-321.0CF.

Black, Francis Bischoff: *See—*
Allred, James Kenneth; Liddell, Arlyn G.; Quinn, Edward Barney; and Black, Francis Bischoff, 4,074,120, Cl. 235-419.000.

Black, Robin Michael: *See—*
White, Alan Chapman; and Black, Robin Michael, 4,073,906, Cl. 424-251.000.

Black, Sivalls & Bryson, Inc.: *See—*
Wood, Loren E., 4,073,402, Cl. 220-207.000.

Blair, Calvin B. Round bale handler. 4,073,532, Cl. 294-107.000.

Blake, Roy Baxter, Jr.; Gwatkin, James deGoulard, III; Magee, Judy Pat; and Porter, Glendon Russell, to Bell Telephone Laboratories, Incorporated. Bidirectional voice frequency repeater. 4,074,087, Cl. 179-170.200.

Blakeley Engineering Limited: *See—*
Blakeley, James, 4,073,513, Cl. 285-93.000.

Blakeley, James, to Blakeley Engineering Limited. Pipe branch fitting. 4,073,513, Cl. 285-93.000.

Blekhman, Ilya Izrailevich: *See—*
Rundkvist, Konstantin Alexandrovich; Ivanov, Nikolai Alexeevich; Ivanov, Boris Gavrilovich; Zarogatsky, Leonid Petrovich; Mitrofanov, Evgeny Sergeevich; and Blekhman, Ilya Izrailevich, 4,073,446, Cl. 241-207.000.

Bloom, Joseph Louis: *See—*
Smith, Trevor Stanley; and Bloom, Joseph Louis, 4,073,135, Cl. 60-39.28R.

Blue Cross Laboratories, Inc.: *See—*
Doumani, Charles, 4,073,411, Cl. 222-192.000.
Doumani, Charles, 4,073,412, Cl. 222-192.000.

Blurton, Keith F.; and Stetter, Joseph R., to Energetics Science, Inc. Method and device for the detection and measurement of carbon monoxide in the presence of hydrogen. 4,073,698, Cl. 204-1.00T.

Boatman, Roger M.; and Hall, Melvin R., to Testline Instruments, Inc. Low impedance fault detection system and method. 4,074,188, Cl. 324-52.000.

BOC Limited: *See—*
Smith, Jack James, 4,073,483, Cl. 269-25.000.

Bodart, Detlef Eugen, to Merck Patent Gesellschaft mit beschrankter Haftung. Analytical determination of substances in solution. 4,073,623, Cl. 23-259.000.

Bodine, Albert G. Sonic large bore earth auger. 4,073,353, Cl. 175-56.000.

Boehm, Oscar: *See—*
Arnold, Franz; Boehm, Oscar; and Cenaruzza, Ignacio, 4,073,197, Cl. 74-110.000.

Boehringer Ingelheim GmbH: *See*—
Barnickel, Heinrich; Sigl, Winfrid; and Schwable, Jorg, 4,073,838, Cl. 264-37.000.
Keck, Johannes; Puschmann, Sigfrid; Kruger, Gerd; Noll, Klaus-Reinhold; Leitold, Matyas; and Pieper, Helmut, 4,073,942, Cl. 424-330.000.
Kummer, Werner; Koppe, Herbert; Stahle, Helmut; and Haarmann, Walter, 4,073,905, Cl. 424-248.560.

Boeing Company, The: *See*—
Hapke, Donald W., 4,073,440, Cl. 239-265.290.
Hicks, Harry Clark, Jr., 4,073,708, Cl. 204-106.000.
Logan, James H., 4,073,258, Cl. 115-12.00R.

Boettcher, Robert L.: *See*—
Laffoon, Perry D.; and Boettcher, Robert L., 4,074,145, Cl. 307-10.00R.

Bogen, John S.; and Robin, Gary I., to Erdco Engineering Corporation. Anticipatory flammable gas detection system. 4,074,243, Cl. 340-237.00R.

Boise Cascade Corporation: *See*—
Hearon, William Montgomery; and Fan, Lo Cheng, 4,073,804, Cl. 260-534.00R.

Bolanz, Gerrit M. Building construction system. 4,073,104, Cl. 52-125.000.

Boldebuck, Edith M.; and Gorowitz, Bernard, to General Electric Company. Powder coatable polyester composition and electrical conductor coated therewith. 4,074,006, Cl. 428-379.000.

Bolli, Giuseppe. Drive mechanisms of spinning or twisting machines adapted for the formation of knop yarn. 4,073,125, Cl. 57-38.300.

Bollian, Erwin, to Doduco, Eugen Durrwachter. Method of and apparatus for manufacturing double contact rivets. 4,073,425, Cl. 228-^{1}16.000.

Bones, Roger John, to Chloride Silent Power Limited. Sealing of electrochemical devices utilizing liquid sodium and a solid ceramic electrolyte permeable to sodium ions. 4,074,026, Cl. 429-104.000.

Boone, Gary W.; and Cochran, Michael J., to Texas Instruments Incorporated. Variable function programmed calculator. 4,074,351, Cl. 364-200.000.

Borg-Warner Corporation: *See*—
Abendschein, Frederic Henry; Ivey, John Saxon; Roberts, Richard W.; and Tothero, Dwight L., 4,073,603, Cl. 417-222.000.

Born, Norman E.; and Kolatorowicz, Edwin E., to General Electric Company. Inductive load current measuring circuit. 4,074,175, Cl. 318-332.000.

Borom, Marcus P., to General Electric Company. Method for removing a magnesia doped alumina core material. 4,073,662, Cl. 134-2.000.

Borroughs Tool & Equipment Corporation: *See*—
Okamuro, James A., 4,073,051, Cl. 29-427.000.

Borst, Alan W.: *See*—
Baker, Daniel, deceased; and Borst, Alan W., 4,074,153, Cl. 310-12.000.

Bosaeus, Jan Anders: *See*—
Margen, Peter Heinrich Erwin; Grimstedt, Harry Evert; and Bosaeus, Jan Anders, 4,073,045, Cl. 29-157.30C.

Bosshard, Ernst, to Sulzer Brothers Limited. Apparatus for treating liquid sludge material. 4,074,138, Cl. 250-435.000.

Boston, Jacquelin Vaughan. Coloring book for the blind. 4,073,070, Cl. 35-26.000.

Bosworth, Clive J.; Bridgstock, Neil E.; Stone, Raymond S.; and McLaughlin, William L., to British Steel Corporation. Apparatus for removing cross welds from metal tubes and marking the same. 4,073,260, Cl. 118-8.000.

Boudreaux, Gordon J.: *See*—
Bailey, August V.; Boudreaux, Gordon J.; Sumrell, Gene; and Novak, Arthur F., 4,074,058, Cl. 560-105.000.

Bouhon, Pierre Hubert Marie Joseph, to Societe Anonyme des Ateliers Houget Duesberg Bosson. Open-end spinning device. 4,073,126, Cl. 57-58.950.

Bouillon, Claude; and Berrebi, Claudine, to L'Oreal. Composition for reducing the oily appearance of the hair and skin. 4,073,898, Cl. 424-233.000.

Boutmy, Patrick E.; and Walraet, Jean G., to Societe Anonyme de Telecommunications. Time division digital transmission system. 4,074,074, Cl. 179-15.0BW.

Bower, Gerald Shelton, to Systron-Donner Corporation. Time limited digital oscillator. 4,074,178, Cl. 318-631.000.

Bowman, Richard C.; and Kay, Daniel J., to Hooker Chemicals & Plastics Corporation. Polyethylene emulsion containing resin binder compositions and processes. 4,073,761, Cl. 260-29.300.

Bowser, Robert E., to Simplimatic Engineering Co. Method and apparatus for tier forming on a row by row basis. 4,073,387, Cl. 214-6.00P.

Bowyer, William Henry: *See*—
Brook, Greville Bertram; Bowyer, William Henry; and Desforges, Charles Desmond, 4,073,400, Cl. 220-63.00R.

Boynton, Robert James: *See*—
Baraff, David Robbin; Boynton, Robert James; and Livermore, Frederick Caldwell, 4,074,109, Cl. 219-216.000.

Brackmann, Warren A.; and DiIanni, Daniel, to Rothmans of Pall Mall Canada Limited. Method of producing polymeric material. 4,073,850, Cl. 264-93.000.

Bradley, William E.; and Gates, Geoffrey Steven, to American Medical Systems, Inc. Urethral profilometry catheter. 4,073,287. Cl. 128-2.00R.

Brady, Jack D.; and Graves, Kenny M., to Andersen 2000, Inc. Stationary drum filtration device and method. 4,073,631, Cl. 55-97.000.

Brandrup, Johannes: *See*—
Gebauer, Gerhard; Brandrup, Johannes; Kraft, Kurt; and Mayer, Franz, 4,074,007, Cl. 428-411.000.

Branigan, John G.: *See*—
Polichette, Joseph; Leech, Edward J.; and Branigan, John G., 4,073,740, Cl. 252-156.000.

Braun A.G.: *See*—
Gaus, Harry, 4,074,070, Cl. 179-1.00D.

Breazeale, Billy H., to Texas Instruments Incorporated. Method of fabricating a photoconductive detector of increased responsivity. 4,073,969, Cl. 427-75.000.

Breitscheidel, Hans-Ulrich: *See*—
Alfter, Franz-Werner; Breitscheidel, Hans-Ulrich; and Lorry, Cosmas, 4,073,535, Cl. 296-137.00A.

Brennan, Thomas M., to Pfizer Inc. 4-Pyridylformimidoylglycyl-D-phenylglycine. 4,073,780, Cl. 260-112.50R.

Bret, Jean-Louis: *See*—
Chaussy, Jacques; Bret, Jean-Louis; Berton, Adrien; and Odin, Jacques, 4,074,343, Cl. 363-14.000.

Brewer, Harold Hazen. Screen printing apparatus. 4,073,232, Cl. 101-126.000.

Brewer, Robert J., to U.S. Philips Corporation. Bulk channel charge coupled semiconductor devices. 4,074,302, Cl. 357-24.000.

Bridgeport Metal Goods Manufacturing Company, The: *See*—
Moore, Arthur H., 4,074,122, Cl. 362-200.000.

Bridgstock, Neil E.: *See*—
Bosworth, Clive J.; Bridgstock, Neil E.; Stone, Raymond S.; and McLaughlin, William L., 4,073,260, Cl. 118-8.000.

Briggs, Donald C.: *See*—
Haas, Ronald J.; and Briggs, Donald C., 4,074,018, Cl. 429-21.000.

British Gas Corporation: *See*—
Anderson, John Alfred, 4,073,627, Cl. 48-62.00R.

British Petroleum Company Limited, The: *See*—
Desty, Denis Henry, 4,073,613, Cl. 431-202.000.

British Steel Corporation: *See*—
Bosworth, Clive J.; Bridgstock, Neil E.; Stone, Raymond S.; and McLaughlin, William L., 4,073,260, Cl. 118-8.000.
Lawson, Robert, 4,073,619, Cl. 23-232.00R.
Marshall, Joseph W.; and Gibson, Keith C, 4,073,173, Cl. 72-250.000.

Broadway, Alexander Richard William, to National Research Development Corporation. Rotary electric machines. 4,074,160, Cl. 310-184.000.

Broburg, Gregory W.; and Clark, Allen C., to Van Alstine Audio Systems, Inc. Equalizing amplifier. 4,074,204, Cl. 330-109.000.

Brockmann, Asher: *See*—
Kulicke, Frederick W., Jr.; Soffa, Albert; Vilenski, Dan; and Brockmann, Asher, 4,073,424, Cl. 228-4.500.

Broken Hill Associated Smelters Proprietary Limited, The: *See*—
Lawson, Frank; Ward, Denby Harcourt; and Kelly, Robert George, 4,073,481, Cl. 266-215.000.

Broman, Rodney L.: *See*—
Ahnell, Joseph E.; Broman, Rodney L.; and Waters, John R., 4,073,691, Cl. 195-103.50M.
Buda, Dennis; Broman, Rodney L.; and Waters, John R., 4,073,694, Cl. 195-103.700.

Brondyke, James R., to Maryland Cup Corporation. Dispensing carton for wrapped drinking straws. 4,073,404, Cl. 221-63.000.

Bronstert, Klaus: *See*—
Ladenberger, Volker; Bronstert, Klaus; Hovemann, Friedrich; and Simak, Petr, 4,073,738, Cl. 252-56.00R.

Brook, Greville Bertram; Bowyer, William Henry; and Desforges, Charles Desmond, to Fulmer Research Institute. Gas containers. 4,073,400, Cl. 220-63.00R.

Brooks, Eyrle E.: *See*—
Maginnes, Edward A.; Brooks, Eyrle E.; Haukeness, Maynard O.; and Green, George H., 4,073,089, Cl. 47-17.000.

Brooks, John Langshaw; and Budziarek, Richard, to Imperial Chemical Industries Limited. Poly-carbonyloxyurethanes. 4,073,800, Cl. 260-404.500.

Brown, Amos J.; Belshaw, Thomas E.; Knull, Kenneth L.; and Wilke, Wilbur D., to Belshaw Brothers, Inc. Siphon pump. 4,073,305, Cl. 137-140.000.

Brown, C. Kepler, Jr.: *See*—
Mulkey, Dennis A.; and Brown, C. Kepler, Jr., 4,073,249, Cl. 112-212.000.

Brown, Francis W.: *See*—
Bateson, George F.; Brown, Francis W.; and Heilmann, Steven M., 4,074,004, Cl. 428-355.000.

Brown, Glendon W.; Fine, Mary Jane; and Hill, Larry O., to Mead Corporation, The. Method for preparing wetproofed catalyst particles and particles produced thereby. 4,073,748, Cl. 252-428.000.

Brown, Harold: *See*—
Ballman, Albert Anthony; Brown, Harold; Martin, John Martin; and Tien, Ping King, 4,073,675, Cl. 156-600.000.

Brown, Lelus B.: *See*—
Keller, Herman F., 4,074,252, Cl. 340-321.000.

Brown, Melvin: *See*—
Wang, Jin-Liang; Brown, Melvin; and Menapace, Henry R., 4,073,820, Cl. 260-683.00D.

Brown, R. Bernard, to United States of America, Navy. Laser total reflectometer. 4,073,590, Cl. 356-209.000.

Brown, Richard E., to Warner-Lambert Company. Indolobenzoxazepines. 4,073,789, Cl. 260-293.580.

Brown & Root, Inc.: *See*—
Smith, Leif Franz Halvor, 4,073,156, Cl. 61-107.000.

Brown, Stanley J.; and Gorholt, Wilhelm, to General Atomic Company. Reactor core lateral restraint assembly. 4,073,685, Cl. 176-87.000.

Brown, William F., Jr.: *See—*
Dupree, Wayne P.; and Brown, William F., Jr., 4,074,273, Cl. 346-34.000.

Bruderhaus Maschinen GmbH: *See—*
Pav, Jarmil, 4,073,444, Cl. 241-73.000.

Bryan, Thomas Toplica; and Pluim, Arthur William, Jr., to Minnesota Mining and Manufacturing Company. Porous ceramic or metallic coatings and articles. 4,073,999, Cl. 428-311.000.

Bryant, Frank E. Prefabricated X-radiation protection panels. 4,074,141, Cl. 250-517.000.

Buchel, Karl Heinz; Frohberger, Paul-Ernst; and Kaspers, Helmut, to Bayer Aktiengesellschaft. Metal complexes of N-trityl-azoles for combatting fungi. 4,073,901, Cl. 424-245.000.

Buchta, Karl, to Siemens Aktiengesellschaft. Circuit arrangement for selective frequency analysis of the amplitudes of one or more signals. 4,074,200, Cl. 325-335.000.

Buckley, Frederick, III; Creamer, Malcom Kenneth, Jr.; and Miller, Gerald Aberdeen, to International Business Machines Corporation. MOS interchip receiver differential amplifiers employing resistor shunt CMOS amplifiers. 4,074,150, Cl. 307-362.000.

Buckley, Frederick, III; Miller, Gerald Aberdeen; and Scotto, Vincent Anthony, to International Business Machines Corporation. MOS interchip receiver differential amplifiers employing CMOS amplifiers having parallel connected CMOS transistors as feedback shunt impedance paths. 4,074,151, Cl. 307-362.000.

Buckwalter, Mervin R.; and Knaub, Edgar W., to Armstrong Cork Company. Process for flatting glossy surfaces of urethane polymers. 4,073,975, Cl. 427-170.000.

Buda, Dennis; Broman, Rodney L.; and Waters, John R., to Johnston Laboratories, Inc. Microbiological assay of aminoglycoside antibiotics. 4,073,694, Cl. 195-103.700.

Budziarek, Richard: *See—*
Brooks, John Langshaw; and Budziarek, Richard, 4,073,800, Cl. 260-404.500.

Buljan, Sergej Tomislav; and Stermer, Philip Eli, to GTE Sylvania Incorporated. High density high strength S13 N4 ceramics prepared by pressureless sintering of partly crystalline, partly amorphous S13 N4 powder. 4,073,845, Cl. 264-65.000.

Bull, Michael J.; and Searle, Robert J. G., to Shell Oil Company. Benzyl ethers. 4,073,812, Cl. 260-613.00R.

Bull, Rame; Denenberg, Byron A.; and Popovic, Djorde R., to MDA Scientific, Inc. Reader recorder for toxic gas concentration tapes. 4,073,621, Cl. 23-254.00E.

Bullock, Milon Walker; and Walworth, Bryant Leonidas, to American Cyanamid Company. Substituted-1-phenol-4-sulfonamides. 4,074,059, Cl. 560-135.000.

Bunting, Walter, to National Research Development Corporation. Signal measuring apparatus. 4,074,190, Cl. 324-77.00A.

Buonavita, Carlos Ernesto, to Burroughs Corporation. Load sharing modular power supply system. 4,074,146, Cl. 307-60.000.

Burchardi, Jurgen: *See—*
Zangenfeind, Helmut; Burchardi, Jurgen; and Lederer, Josef, 4,073,588, Cl. 355-41.000.

Burgess, Ronald R., to Tom McGuane Industries, Inc. Throttle control system. 4,073,272, Cl. 123-103.00B.

Burkholder, Theodore B.; Stalter, Robert J.; and Skotynsky, Paul N., to Goodyear Tire & Rubber Company, The. Method of zone pouring foam products. 4,073,839, Cl. 264-45.100.

Burkholder, Theodore B.: *See—*
Stalter, Robert J.; and Burkholder, Theodore B., 4,073,020, Cl. 5-355.000.

Burlington Industries, Inc.: *See—*
Crawford, William B.; and Solomon, Anthony T., 4,073,246, Cl. 112-121.110.

Burns, Timothy L.: *See—*
Whittington, Billy J.; Welsh, Alan B.; and Burns, Timothy L., 4,073,209, Cl. 84-1.240.

Burris, Michael V. Asphalt-gilsonite emulsion. 4,073,659, Cl. 106-277.000.

Burroughs Corporation: *See—*
Bader, Clifford John, 4,074,197, Cl. 324-205.000.
Buonavita, Carlos Ernesto, 4,074,146, Cl. 307-60.000.
Cook, Darwen John; and Millers, Donald Alexander, II, 4,074,352, Cl. 364-200.000.
Hardwick, John F., 4,074,328, Cl. 360-77.000.
O'Reilly, James Michael; and Murison, Alexander Smith, 4,074,331, Cl. 360-104.000.
Smith, Douglas A., 4,074,326, Cl. 360-55.000.

Burroughs Wellcome Co.: *See—*
Wood, Hamish Christopher Swan; and Stirling, Irene, 4,073,786, Cl. 260-251.500.

Burry, Arthur. Method of multi-material injection moulding. 4,073,854, Cl. 264-161.000.

Bury, Norman Albert, to Flexibox Limited. Flexible couplings. 4,073,161, Cl. 64-13.000.

Bustin, Leopold. Multi-way grab rail. 4,073,036, Cl. 16-110.00R.

Butler, Walter J.; and Eichelberger, Charles W., to General Electric Company. Analog-to-digital converter. 4,074,260, Cl. 340-347.0CC.

Butts, Bruce D.: *See—*
Keough, Laurence J.; and Butts, Bruce D., 4,074,088, Cl. 200-5.00A.

Buysch, Hans-Josef; Oertel, Harald; and Roos, Ernst, to Bayer Aktiengesellschaft. Mixtures of α,α'-bis-(2-hydroxy-3,5-dialkylphenyl)-p-and -m-diisopropylbenzenes, a process for the preparation thereof and the use thereof as stabilizers. 4,073,746, Cl. 252-404.000.

Buzga, Heinrich; Steprath, Werner; and Pause, Kurt, to Maschinenfabrik Buckau R. Wolf Aktiengesellschaft. Process for cleaning comminuted plastic material. 4,073,661, Cl. 134-1.000.

Byalko, Mikhail Vladimirovich; Kirko, Elena Viktorovna; Perlovsky, Rafael Shliomovich; and Ryzhnev, Vadim Jurievich. Pneumatic detector of gas and vapor contaminants in atmosphere of industrial buildings. 4,073,183, Cl. 73-23.000.

C. H. Heist Corporation: *See—*
Goodwin, Robert J., 4,073,026, Cl. 15-104.10R.

C. & J. Clark Ltd.: *See—*
Bailey, Frank Gordon; and Ralphs, George Trevor, 4,073,022, Cl. 12-135.00A.

Cabasso, Israel; Jagur-Grodzinski, Joseph; and Vofsi, David. Polymer alloys of phosphonylated polystyrene or polyphenylene oxide with cellulose ester, polystyrene, or unsaturated polyester. 4,073,754, Cl. 260-17.00R.

Cagle, Harlan R., to Sahlin International Inc. Vacuum producing device. 4,073,602, Cl. 417-185.000.

Cairns, Robert Lacock: *See—*
Volin, Timothy Earl; Benjamin, John Stanwood; Larson, Jay Michael; and Cairns, Robert Lacock, 4,073,648, Cl. 75-245.000.

Calderazzo, Franklin J.: *See—*
O'Brien, John G.; and Calderazzo, Franklin J., 4,073,391, Cl. 214-65.000.

Caldwell, Donald Lee; and Fuchs, Raymond John, Jr., to Dow Chemical Company, The. Catalytic decomposition of hypochlorite. 4,073,873, Cl. 423-499.000.

Cale, Albert Duncan, Jr., to A. H. Robins Company, Inc. N-(1-substituted-3-pyrrolidinyl)-1-naphthalene carboxamides. 4,073,796, Cl. 260-326.330.

Callery, Patrick S.; Wright, Jeremy; and Zenker, Nicolas, to Merck & Co., Inc. 3-(2-Substituted benzimidazolyl) alanines. 4,073,929, Cl. 424-273.00R.

Camirand, Wayne M.: *See—*
Popper, Karel; Camirand, Wayne M.; Williams, Gerald S.; and Mecchi, Edward P., 4,073,747, Cl. 252-412.000.

Cammilleri, Angelo M., to Telejector Ltd. Television projector. 4,074,322, Cl. 358-237.000.

Campeau, Leo. Wheel board undulating coaster. 4,073,500, Cl. 280-87.04R.

Canadian Patents and Development Limited: *See—*
Maginnes, Edward A.; Brooks, Eyrle E.; Haukeness, Maynard O.; and Green, George H., 4,073,089, Cl. 47-17.000.

Canon Kabushiki Kaisha: *See—*
Kitajima, Tadayuki, 4,073,584, Cl. 355-8.000.
Nakamoto, Soichi; Ito, Tadashi; Ito, Fumio; and Isobe, Yasuo, 4,074,292, Cl. 354-53.000.

Capsulated Systems, Incorporated: *See—*
Bayless, Robert G., 4,073,946, Cl. 426-2.000.

Caputo, Salvatore; Fitch, Scott McDowell; Harris, Cliff Andrew; Kuhar, John, Jr.; Pappas, Andrew Leo; and Redlich, Wayne, to Bell Telephone Laboratories, Incorporated. Test set for measuring jitter distortion of data pulses. 4,074,358, Cl. 364-514.000.

Carl Zeiss-Stiftung: *See—*
Schwebel, Reiner, 4,074,131, Cl. 250-237.00G.

Carley, Harold E.: *See—*
Miller, George A.; Chan, Hak-Foon; and Carley, Harold E., 4,073,921, Cl. 424-273.00R.

Carlisle, Richard S. Differential-pressure flotation cushion. 4,073,021, Cl. 5-365.000.

Carlsson, Eric; Gefvert, Karl Ivan; Hjalmarsson, Thomas; Kerff, Anton; Pejchal, Karel; and Wide, Lars, to Aktiebolaget IRO. Device for holding yarn bobbins. 4,073,450, Cl. 242-131.000.

Carnegie-Mellon University: *See—*
Shaw, Milton C.; and Hoshi, Tetsutaro, 4,073,214, Cl. 90-24.00D.

Caron, Ronald N.; and Shapiro, Stanley, to Olin Corporation. Processing for improved stress relaxation resistance in copper alloys exhibiting spinodal decomposition. 4,073,667, Cl. 148-12.70C.

Carson, Chester C.; Barton, Sterling C.; and Echeverria, Federico S., to General Electric Company. Heated ion chamber detector for a dynamoelectric machine. 4,074,137, Cl. 250-380.000.

Carter, Norman R., to Zetco Manufacturing Company, Incorporated. Semi-automatic lifting system. 4,073,388, Cl. 214-8.50A.

Cartwright, Neil B. Photographic processing machine. 4,074,298, Cl. 354-299.000.

Caruso, Jerome, to Litton Business Systems, Inc. Bonded chair construction. 4,073,539, Cl. 297-455.000.

Carvalho, Ronald M. Attack dog security system. 4,074,247, Cl. 340-276.000.

Casalou, Robert A., to Robert A. Casalou, Inc. Spot light assembly. 4,074,125, Cl. 362-271.000.

Cassar, Richard D., to Sun Ventures, Inc. Insecticide from dimethylmuconic acid. 4,073,896, Cl. 424-205.000.

Cassella Farbwerke Mainkur Aktiengesellschaft: *See—*
Heid, Christian; and Polster, Johannes, 4,073,616, Cl. 8-34.000.

Cassidy, Francis J.: *See—*
Leaf, Harry Vincent; and Cassidy, Francis J., 4,074,065, Cl. 174-87.000.

Cassidy, Raymond T., to National Blank Book Company, Inc. Mag card storage device. 4,073,553, Cl. 312-184.000.

Caterpillar Tractor Co.: *See—*
Gianessi, Albert, 4,073,524, Cl. 292-341.120.
Goloff, Alexander, 4,073,221, Cl. 92-221.000.

Heitzman, Gary N.; and Shook, Norma G., 4,073,591, Cl. 403-24.000.
Lohbauer, Kenneth R., 4,073,141, Cl. 60-421.000.

Cav Limited: *See—*
Nicolls, Wilfrid Edward Walter, 4,073,276, Cl. 123-139.00E.

Cawley, William H.: *See—*
Rowe, Edward A., Jr.; and Cawley, William H., 4,073,066, Cl. 34-73.000.

Cefilac: *See—*
Perret, Claude, 4,073,160, Cl. 64-9.00R.

Celanese Corporation: *See—*
Kalnin, Ilmar L., 4,073,869, Cl. 423-447.100.

Celeste, Lawrence S. Shelf protector. 4,073,384, Cl. 211-134.000.

Celotex Corporation, The: *See—*
Barnhart, David A.; and Loftin, Gordy E., 4,073,597, Cl. 415-201.000.

Cenaruzza, Ignacio: *See—*
Arnold, Franz; Boehm, Oscar; and Cenaruzza, Ignacio, 4,073,197, Cl. 74-110.000.

Centralny Osrodek Badawczo-Rozwojowy Maszyn Wlokienniczych: *See—*
Ostrowski, Jerzy; Sierputowski, Piotr; Turkowski, Lukasz; Jablkiewicz, Jerzy; Pacholski, Jan; and Jedryka, Tadeusz, 4,073,128, Cl. 57-58.890.
Ostrowski, Jerzy; Sierputowski, Piotr; Turkowski, Lukasz; Jablkiewicz, Jerzy; Pacholski, Jan; and Jedryka, Tadeusz, 4,073,129, Cl. 57-58.890.

Centre de Recherche d'Architecture d'Urbanisme et de Construction Rauc: *See—*
Oudot, Pierre Armand; and Petroff, Leon, 4,073,113, Cl. 52-710.000.

Centre de Recherches Metallurgiques Centrum Voor Research in de Metallurgie: *See—*
Etienne, Arlette Therese, 4,073,332, Cl. 164-4.000.

Centre Europeen de Recherches Pharmacologiques C.E.R.P.H.A.: *See—*
Porte, Laurent, 4,073,940, Cl. 424-324.000.

Centronics Data Computer Corporation: *See—*
Prager, Jay, 4,073,371, Cl. 197-157.000.

Cepkauskas, Martin D., to Combustion Engineering, Inc. Releasable extension shaft coupling. 4,073,684, Cl. 176-86.00R.

Cerberus AG: *See—*
Niederost, Werner; and Durrer, Bernhard, 4,074,341, Cl. 361-331.000.

Cerefice, Steven A.; and Fields, Ellis K., to Standard Oil Company (Indiana). 7,8 Diacyl bicyclo[2.2.2]bis(2,3-dicarboximide) compounds. 4,073,794, Cl. 260-326.00C.

Ceskoslovenska akademie ved: *See—*
Lim, Drahoslav; Kopecek, Jindrich; Bazilova nee Sverinova, Hedvika; and Vacik, Jiri, 4,074,039, Cl. 526-303.000.

Champion International Corporation: *See—*
Nelson, Iver L., 4,073,119, Cl. 53-76.000.

Chan, Hak-Foon: *See—*
Miller, George A.; Chan, Hak-Foon; and Carley, Harold E., 4,073,921, Cl. 424-273.00R.

Chandler, Keith L.; Hyldon, Roy G.; Kumar, Surinder; and O'Mahony, John P., to Quaker Oats Company, The. Process for producing modified protein. 4,073,948, Cl. 426-44.000.

Chapin and Bangs Company, The: *See—*
DeNomme, George L., 4,073,386, Cl. 214-1.00F.

Chapman, Samuel L. Blood sampling syringe. 4,073,288, Cl. 128-2.00F.

Chapurlat, Robert, to Rhone-Poulenc, S.A. Anisotropic phenolic polyether membrane. 4,073,724, Cl. 210-23.00H.

Charransol, Pierre; Hauri, Jacques; and Athenes, Claude, to Thomson-CSF. TST exchange with series-mode space switching stage. 4,074,077, Cl. 179-15.0AT.

Chasey, Henry G., to Koppers Company, Inc. Articulated disc valve. 4,073,472, Cl. 251-229.000.

Chaussy, Jacques; Bret, Jean-Louis; Berton, Adrien; and Odin, Jacques, to Agence Nationale de Valorisation de la Recherche (ANVAR). Electric current chopper. 4,074,343, Cl. 363-14.000.

Chemetron Corporation: *See—*
Hansen, Arne; and Troup, George, 4,073,464, Cl. 251-26.000.

Chemische Werke Huels Aktiengesellschaft: *See—*
Berg, Gerhard; and Nordsiek, Karl-Heinz, 4,073,755, Cl. 260-17.4BB.

Chen, Chun-Pa. Construction for a water hammer type pump. 4,073,604, Cl. 417-226.000.

Chestnov, Robert E., to Jaclyn, Inc. Method of forming a design and an accessory article. 4,073,853, Cl. 264-132.000.

Chevron Research Company: *See—*
Colliman, James P., 4,073,778, Cl. 260-78.00L.

Chiarani, Lino: *See—*
Zumin Tricerri, Silvia; and Chiarani, Lino, 4,073,903, Cl. 424-246.000.

Chicago Dryer Company: *See—*
Kober, Kasimir, 4,073,486, Cl. 270-69.000.

Chicago Rawhide Manufacturing Co.: *See—*
Jackowski, Ronald A., 4,073,540, Cl. 301-108.00A.

Chloride Silent Power Limited: *See—*
Bones, Roger John, 4,074,026, Cl. 429-104.000.

Chono, Masazumi: *See—*
Doi, Tsunesuke; Komoto, Hiroshi; Chono, Masazumi; Inoue, Akira; Saito, Kazuaki; and Shinozuka, Isao, 4,073,618, Cl. 21-2.70R.

Chou, Eng J.: *See—*
Okamoto, Yoshiyuki; Wang, Joseph Y.; and Chou, Eng J., 4,073,726, Cl. 210-45.000.

Christ, Alfred; Lehmann, Rolf; and Miller, Helmut, to Escher Wyss Limited. Hydrostatic supporting device. 4,073,549, Cl. 308-9.000.

Christensen, Carl; Hause, Arthur Dickson; and McDonald, Henry Stanton, to Bell Telephone Laboratories, Incorporated. Multiprocessor control of a partitioned switching network by control communication through the network. 4,074,072, Cl. 179-15.0AQ.

Christensen, Inc.: *See—*
Rowley, David S.; Walker, Bruce H.; Fielder, Coy M.; and Rohde, Heino J., 4,073,354, Cl. 175-329.000.

Christidis, Yani; and Depernet, Dominique, to Nobel Hoechst Chimie. Imidazoles and 2-alkyl imidazoles and method for their manufacture. 4,074,054, Cl. 548-335.000.

Christy, Charles A. Positive displacement vane type rotary pump. 4,073,608, Cl. 418-241.000.

Christy, Ronald I., to Hughes Aircraft Company. Bearing retainer. 4,073,552, Cl. 308-201.000.

Chroma-Flex, Inc.: *See—*
Wynn-Smith, David, 4,074,309, Cl. 358-82.000.

Chu, Chung Kwang: *See—*
Watanabe, Kyoichi Aloisius; Chu, Chung Kwang; and Fox, Jack Jay, 4,074,042, Cl. 536-1.000.

Chu, Edward J., to Resistoflex Corporation. Method of fabricating welded PFA-to-PTFE structures. 4,073,856, Cl. 264-259.000.

Chu, Frank K. Y.: *See—*
Fein, Marvin Michael; Patnaik, Birendra Kumar; and Chu, Frank K. Y., 4,073,766, Cl. 260-42.140.

Chung, Daniel A., to Goodyear Tire & Rubber Company, The. Shock absorbing unit molded from polyurethane (urea) rubber composition. 4,073,858, Cl. 264-262.000.

Ciaccio, Leonard L.; and Hameyer, Klaus. Method and apparatus for automated measurement of energy oxygen. 4,073,692, Cl. 195-103.50R.

Ciba-Geigy AG: *See—*
Jager, Horst, 4,073,817, Cl. 260-653.10T.

Ciba-Geigy Corporation: *See—*
Beriger, Ernst, 4,073,932, Cl. 424-279.000.
Green, George Edward, 4,074,008, Cl. 428-418.000.
Havalda, Paul, 4,073,065, Cl. 34-71.000.
Huebner, Charles Ferdinand, 4,073,911, Cl. 424-267.000.
Lacroix, Roger; and Haberli, Roland, 4,073,615, Cl. 8-25.000.
Mitra, Panchanan, 4,073,670, Cl. 156-179.000.
Scartazzini, Riccardo; and Bickel, Hans, 4,073,902, Cl. 424-246.000.

Cilento, Rudolfo D.; and Hill, John Anthony, to E. R. Squibb & Sons, Inc. Method of using drying oils as oxygen scavenger. 4,073,861, Cl. 423-219.000.

Cincinnati Milacron Inc.: *See—*
Dawson, James Earl, 4,073,944, Cl. 425-146.000.

Citizen Watch Company Limited: *See—*
Sekiya, Fukuo; and Ebihara, Heihachiro, 4,074,256, Cl. 340-336.000.

City Tank Corporation: *See—*
McKenzie, Roland W.; and Stansberry, Richard, 4,073,393, Cl. 214-83.300.

Clark, Allen C.: *See—*
Broburg, Gregory W.; and Clark, Allen C., 4,074,204, Cl. 330-109.000.

Clark, William H. Magnetic lock pick. 4,073,166, Cl. 70-394.000.

Clarke, Geoffrey, to Square D Company. Protection circuits for computer based control systems. 4,074,336, Cl. 361-88.000.

Clarke, John Alfred; and Howden, Harry, to U.S. Philips Corporation. Optical projector. 4,073,574, Cl. 350-189.000.

Clarke, John T.; Harker, Royce K.; Hittmeier, Michael E.; and Eaton, James W., to Masonite Corporation. Post-press embossing of a consolidated man-made board. 4,073,672, Cl. 156-219.000.

Clayton, Thomas S.: *See—*
Nash, Dudley O.; and Clayton, Thomas S., 4,073,441, Cl. 239-265.410.

Clegg, Ronald L. E.: *See—*
Pank, John C.; and Clegg, Ronald L. E., 4,073,326, Cl. 144-209.00R.

Clement, Clyde H. Trunk loading apparatus. 4,073,395, Cl. 214-450.000.

Clonch, David, to S & S Corporation. Feeder crusher. 4,073,445, Cl. 241-101.700.

Close, James R.; and Johnson, James R., to Minnesota Mining and Manufacturing Company. Process for wear-resistant ducts. 4,073,318, Cl. 138-149.000.

Clow, Richard G. Parallel data processing system. 4,074,361, Cl. 364-713.000.

Coburn, Robert E., to Molins Machine Company, Inc. Continuous running machines for producing paperboard box blanks. 4,073,222, Cl. 93-36.00M.

Cochran, Michael J.: *See—*
Boone, Gary W.; and Cochran, Michael J., 4,074,351, Cl. 364-200.000.

Codman & Shurtleff, Inc.: *See—*
Hickey, Robert J., deceased; and Hickey, Lisa M., administratrix, 4,073,179, Cl. 72-409.000.

Coe, Peter: *See—*
Aylmer, Norman Noel; Coe, Peter; Watson, John Graham; and Holloway, Brian Percy, 4,073,157, Cl. 61-111.000.

Cole, James D. Electric motor assembly. 4,074,158, Cl. 310-90.000.

Colgate Palmolive Company: *See—*
Ramachandran, Pallassana, 4,073,735, Cl. 252-8.800.

Colin, Jean-Paul, to Ste Anonyme dite: Ateliers et Chantiers de Bretagne - A CB. Device enabling the immobilizing of a piston in its cylinder. 4,073,217, Cl. 92-27.000.

Collin, Per Harald; Flink, Sune Natanael; Widell, Bjorn; Hirsch, Martin; and Reh, Lothar, to Stora Kopparbergs Bergslags Aktiebolag. Method for reducing material containing iron oxides. 4,073,642, Cl. 75-35.000.

Collins, David J., to General Electric Company. Shaft axial position monitoring system. 4,073,184, Cl. 73-37.600.

Collman, James P., to Chevron Research Company. Crown ether activated lactam polymerization. 4,073,778, Cl. 260-78.00L.

Combustion Engineering, Inc.: *See—*
Cepkauskas, Martin D., 4,073,684, Cl. 176-86.00R.
Lowrie, Neely E., 4,073,734, Cl. 210-532.00R.

Comfort Products, Inc.: *See—*
Gross, Alexander Louis; and Giese, Erik O., 4,073,072, Cl. 36-44.000.

Commissariat a l'Energie Atomique: *See—*
Dumont, Maurice; and Marie, Gerard, 4,073,434, Cl. 237-2.00B.

Commonwealth Scientific and Industrial Research Organization: *See—*
Scott, Trevor William; and Hills, Geoffrey Dean Loftus, 4,073,960, Cl. 426-580.000.

Conklin, Robert M.; Everett, Charles J.; and Human, Arthur T., to Holmes Protection, Inc. Contact system for sensing closures. 4,074,246, Cl. 340-274.00R.

Construction Aids, Inc.: *See—*
Knutson, Carlton N., 4,073,109, Cl. 52-281.000.

Conwed Corporation: *See—*
Akerson, David Wallace, 4,073,230, Cl. 101-32.000.

Cook, Darwen John; and Millers, Donald Alexander, II, to Burroughs Corporation. Modular block unit for input-output subsystem. 4,074,352, Cl. 364-200.000.

Coope, Robert L.; and Munson, Lowell W., to Stevens Engineering. Sub plate assembly for machine tools. 4,073,215, Cl. 90-58.00R.

Cooper, Stephen Robert. Alarm box with fingerprint recorder. 4,074,250, Cl. 340-304.000.

Coppell, Stephen M.; and Harrow, Terence A., to G. D. Searle & Co. Propionamide antitumor agents. 4,073,807, Cl. 260-562.00N.

Cordier, Georges, to Rhone-Poulenc Industries. Process for the preparation of unsaturated alcohols. 4,073,813, Cl. 260-617.00C.

Cornforth, John W.; Schofield, John A.; French, Sidney J.; and Gray, Robin T., to Shell Oil Company. Process for the preparation of 2,2-bis(3,5-di-t-butyl-4-hydroxyphenyl)propane. 4,073,815, Cl. 260-619.00A.

Corning Glass Works: *See—*
Allen, Richard E., 4,073,970, Cl. 427-96.000.
Wu, Che-Kuang, 4,073,654, Cl. 106-52.000.

Cotton, Faye O.: *See—*
Whisman, Marvin L.; Reynolds, James W.; Goetzinger, John W.; and Cotton, Faye O., 4,073,719, Cl. 208-180.000.
Whisman, Marvin L.; Goetzinger, John W.; and Cotton, Faye O., 4,073,720, Cl. 208-180.000.

Couture, Paul A.: *See—*
Jentoft, Arthur P.; and Couture, Paul A., 4,073,097, Cl. 52-22.000.

Cowan, Owen O.: *See—*
Dibler, Carson E., deceased; McDonald, Ruth, successor; and Cowan, Owen O., 4,073,392, Cl. 214-83.100.

Cox, Bernard K. Apparatus for producing a foldable plastic strip. 4,073,610, Cl. 425-577.000.

CPC International Inc.: *See—*
Daggy, Elmer E., 4,073,963, Cl. 426-658.000.

Crawford, Donald C., to FMC Corporation. Bag slow down. 4,073,223, Cl. 93-93.0HT.

Crawford, William B.; and Solomon, Anthony T., to Burlington Industries, Inc. Pleating machine. 4,073,246, Cl. 112-121.110.

Creamer, Malcom Kenneth, Jr.: *See—*
Buckley, Frederick, III; Creamer, Malcom Kenneth, Jr.; and Miller, Gerald Aberdeen, 4,074,150, Cl. 307-362.000.

Creely, William G. Appointment reminders. 4,074,251, Cl. 340-309.400.

Crepaco, Inc.: *See—*
Wakeman, Alden H.; and Heiliger, Leonard R., 4,073,605, Cl. 417-283.000.

Croft, John C., to Ric-Wil, Incorporated. Apparatus for generating plastic foam. 4,074,363, Cl. 366-138.000.

Crosslen, Louis John, to Frank Mayer & Associates, Inc. Display case for use with a merchandise display rack. 4,073,557, Cl. 312-284.000.

Crowle, Brian, to RCA Corporation. Voltage regulators of a type using a common-base transistor amplifier in the collector-to-base feedback of the regulator transistor. 4,074,181, Cl. 323-8.000.

Crowley, Norman R.; and Walker, Charles M. Laminate stacking apparatus and method. 4,073,373, Cl. 198-421.000.

Crowley, Patrick Jelf: *See—*
Balasubramanyan, Sugavanam; Shephard, Margaret Claire; and Crowley, Patrick Jelf, 4,073,923, Cl. 424-273.00R.

Csenky, Laszlo, to Szarvasi Vas-Femipari Szovetkezet. Safety power track system. 4,074,092, Cl. 200-51.070.

Cunningham, Sinclair Upton; and Jackson, Douglas, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the. Automatic machines. 4,073,247, Cl. 112-121.120.

Curry, Edward G.; and Sanders, Vernard W., to Henry Soss and Company. Hinge pintle retaining means. 4,073,037, Cl. 16-169.000.

Curry, Edward G.; and Sanders, Vernard W., to Henry Soss and Company. Pintle with adjustable spring tension motor. 4,073,038, Cl. 16-189.000.

Curtis, John P.: *See—*
Hurney, Paul A.; and Curtis, John P., 4,074,310, Cl. 358-84.000.

Curtiss-Wright Corporation: *See—*
Myers, David M., 4,073,268, Cl. 123-8.130.

Custom Trailers Mfg., Inc.: *See—*
Storm, Nelson "Jack", 4,073,593, Cl. 404-114.000.

Cutler-Hammer, Inc.: *See—*
Bischof, John F.; and Fritsch, Ronald J., 4,074,091, Cl. 200-50.00A.
Hults, Harold W.; and Swessel, John A., Jr., 4,074,100, Cl. 200-339.000.

Cutters Machine Company, Inc.: *See—*
Gratsch, Jack M.; and Frederick, Cecil S., 4,073,206, Cl. 83-489.000.

Daggy, Elmer E., to CPC International Inc. Stable, homogeneous buttered table syrups. 4,073,963, Cl. 426-658.000.

Daimler-Benz Aktiengesellschaft: *See—*
Klie, Wolfgang, 4,073,528, Cl. 293-98.000.
Resch, Reinhard, 4,073,543, Cl. 303-10.000.

Dainichi Kinzoku Kogyo Co., Ltd.: *See—*
Ueda, Masanobu, 4,074,349, Cl. 364-107.000.

Daisley, Robert Thomas: *See—*
Hinchcliffe, Dennis; Daisley, Robert Thomas; Harper, Stanley Bernard; and Kilborn, Hilary Mark How'l, 4,073,374, Cl. 198-425.000.

Dale, Richard, to Appollon Designs, Inc. Stand for calculator. 4,073,460, Cl. 248-441.00R.

Damone, Frank, to Damone, Frank. Stroller for a child. 4,073,499, Cl. 280-1.10R.

Dana Corporation: *See—*
Guenther, William D., 4,073,220, Cl. 92-190.000.
Kress, Robert F., 4,073,601, Cl. 416-242.000.

Danckert, Hermann, to Volkswagenwerk Aktiengesellschaft. Vehicle with energy absorbing chassis and engine restraint. 4,073,357, Cl. 180-64.00R.

Danguillier, Wilhelm: *See—*
Gernhardt, Paul; Grams, Wolfgang; Danguillier, Wilhelm; and Pohl, Siegfried, 4,073,628, Cl. 48-62.00R.

Danioni, Francesco, to Italo Danioni S.d.f.; and Sio-Societa per l'Industria dell'Ossigeno e di Altri Gas S.p.a., part interest to each. Comminuting plant at cryogenic temperatures. 4,073,443, Cl. 241-65.000.

Danon, David: *See—*
Swank, Roy L.; and Danon, David, 4,073,723, Cl. 210-23.00R.

Dardenne, Regis, to ACEC, Ateliers de Constructions Electriques de Charleroi. Method and apparatus for measuring the position of a magnetic rod. 4,074,185, Cl. 324-208.000.

Darnbrough, Kenneth: *See—*
Sharpe, Raymond; and Darnbrough, Kenneth, 4,074,180, Cl. 322-29.000.

Darragh, John Irvine; and Inglis, Hugh Stewart, to Imperial Chemical Industries Limited. Manufacture of pyridine and methylpyridines. 4,073,787, Cl. 260-290.00P.

D'Arrigo, Sebastiano; and Ghiringhelli, Giovanni, to SGS-ATES Componenti Elettronici S.p.A. Protective device for a power element of an integrated circuit. 4,074,334, Cl. 361-79.000.

Dart Industries, Inc.: *See—*
Fein, Marvin Michael; Patnaik, Birendra Kumar; and Chu, Frank K. Y., 4,073,766, Cl. 260-42.140.

Dashineau, Melvin A.: *See—*
Ueltz, Herbert F. G.; Dashineau, Melvin A.; and Pino, James J., 4,073,096, Cl. 51-309.00A.

Data Packaging Corporation: *See—*
Lyman, George F., 4,073,695, Cl. 195-127.000.

Daugherty, Charles R. Temporary structure. 4,073,105, Cl. 52-169.900.

Davis, Chester B. Fishing worm threader. 4,073,083, Cl. 43-4.000.

Davis, Earl Klimer; Rogers, William Oakley; and Silvis, Duane Charles, to Motorola, Inc. Glass for semiconductors. 4,073,657, Cl. 106-73.500.

Davis, George B., Jr. Christmas tree series light string. 4,073,564, Cl. 339-157.00C.

Davis, Gilbert E., to Energy Research. Valve control apparatus for rotary engines. 4,073,216, Cl. 91-480.000.

Davis, Robert H.: *See—*
Schick, John W.; and Davis, Robert H., 4,073,736, Cl. 252-31.000.

Davis, Walter L.; and Svehaug, Henry V., to Applied Magnetics, Inc. Crab butchering machine. 4,073,041, Cl. 17-71.000.

Dawson, James Earl, to Cincinnati Milacron Inc. Nozzle shut-off valve. 4,073,944, Cl. 425-146.000.

De Laval Separator Company, The: *See—*
D'Orsay, James Alvin, 4,073,339, Cl. 165-94.000.

DeBisschop, James George, to Torrington Company, The. Thrust washer strip. 4,073,162, Cl. 64-17.00R.

Debortoli, George; and Zimmermann, Detlef, to Northern Telecom Limited. Protector for telecommunication lines. 4,074,337, Cl. 361-124.000.

De brey, Robert J.; and Thom, Richard S. Food handling tongs. 4,073,533, Cl. 294-118.000.

Dechene, Ronald L.; Grimaldi, Frank G.; and Newton, Robert E., to Auburn International, Inc. Nonconductive vapor/solid or liquid fraction determination. 4,074,184, Cl. 324-30.00R.

Deeg, Emil W.; and Krohn, David A., to American Optical Corporation. Ophthalmic lens with locally variable index of refraction and method of making same. 4,073,579, Cl. 351-169.000.

Defibrator Aktiebolag: *See—*
Virving, Nils G., 4,073,442, Cl. 241-37.000.

de Jager, Frank; and Martony, Juan Jose, to U.S. Philips Corporation.

Vestigial-sideband transmission system for synchronous data signals. 4,074,199, Cl. 325-50.000.

Del Norte Technology, Inc.: *See*—
Parker, William H., 4,073,341, Cl. 166-65.00R.

DeLano, Merritt V., Jr., to Phillips Petroleum Company. Production of carbon monoxide. 4,073,630, Cl. 48-197.00R.

Dell, Basil, to Hendren, Gilbert T., Jr., a part interest. Cranking system of varying radius. 4,073,196, Cl. 74-52.000.

DeLorean, Jack Z.; and Bacon, David C., to Grand Prix of America, Inc. Timing system. 4,074,117, Cl. 235-92.00T.

de Montigny, Armand: *See*—
Moretto, Hans-Heinrich; de Montigny, Armand; Thom, Karl-Friedrich; and Schliebs, Reinhard, 4,073,801, Cl. 260-448.20E.

Denenberg, Byron A.: *See*—
Bull, Rame; Denenberg, Byron A.; and Popovic, Djorde R., 4,073,621, Cl. 23-254.00E.

DeNomme, George L., to Chapin and Bangs Company, The. Powered material handling apparatus. 4,073,386, Cl. 214-1.00F.

De Nora, Oronzio; and De Nora, Vittorio, to Oronzio de Nora Impianti Elettrochimici, S.p.A. Electrolysis cell with vertical anodes and cathodes and method of operation. 4,073,715, Cl. 204-256.000.

De Nora, Vittorio: *See*—
De Nora, Oronzio; and De Nora, Vittorio, 4,073,715, Cl. 204-256.000.
Spaziante, Placido Maria; Santi, Rinaldo; and De Nora, Vittorio, 4,073,707, Cl. 204-105.00R.

Depernet, Dominique: *See*—
Christidis, Yani; and Depernet, Dominique, 4,074,054, Cl. 548-335.000.

Derain, Christian, to Societe Nouvelle des Bennes Saphem. Movable container adjustable in height, for loading on a vehicle. 4,073,396, Cl. 214-515.000.

Derbyshire, George Cecil, to Jacobs Manufacturing Company, Limited, The. Drill chucks. 4,073,498, Cl. 279-62.000.

Desforges, Charles Desmond: *See*—
Brook, Greville Bertram; Bowyer, William Henry; and Desforges, Charles Desmond, 4,073,400, Cl. 220-63.00R.

Desty, Denis Henry, to British Petroleum Company Limited, The. Flarestack Coanda burners with self-adjusting slot at pressure outlet. 4,073,613, Cl. 431-202.000.

de Taddeo, Giancarlo: *See*—
Favron, Sergio, 4,073,084, Cl. 43-42.350.

Detwiler, John H.: *See*—
Koehn, Wilbur R.; and Detwiler, John H., 4,073,280, Cl. 124-72.000.

Deutsche Babcock Aktiengesellschaft: *See*—
Schiemichen, Peter, 4,073,155, Cl. 61-88.000.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Bertram, Heidrun; Fahnenstich, Rudolf; Offermanns, Heribert; and Tanner, Herbert, 4,073,945, Cl. 426-2.000.
Koch, Karlheinz; Kolaczinski, Gerhard; Rupilius, Wolfgang; and Stein, Werner, 4,074,013, Cl. 428-457.000.
Roebke, Wolfgang; Kneitel, Dieter; and Parr, Erfried, 4,073,867, Cl. 423-429.000.
vonBebenburg, Walter; and Offermanns, Heribert, 4,073,792, Cl. 260-296.00H.

Deutsche Texaco Aktiengesellschaft: *See*—
Herrmann, Rudolf, 4,073,816, Cl. 260-648.00R.

Devine, Thomas M., Jr., to General Electric Company. Method for joining an anode target comprising tungsten to a graphite substrate. 4,073,426, Cl. 228-122.000.

Dexter, John L.; Kyser, Edmond L.; Mitchell, Charles S.; and Sears, Stephan B., to Silonics, Inc. Ink supply system and print head. 4,074,284, Cl. 346-140.00R.

Dey, Thomas W., to Bausch & Lomb Incorporated. Lighting panel. 4,074,126, Cl. 362-297.000.

Dhein, Rolf: *See*—
Eimers, Erich; Margotte, Dieter; Schmid, Helmut; and Dhein, Rolf, 4,073,769, Cl. 260-45.80R.

Diagnostic Data, Inc.: *See*—
Karler, Arthur, 4,073,897, Cl. 424-230.000.

Diamond Shamrock Corporation: *See*—
Holm, Robert E.; and Battershell, Robert D., 4,073,637, Cl. 71-94.000.
Nagy, Zoltan, 4,073,706, Cl. 204-98.000.
Rowe, Edward A., Jr.; and Cawley, William H., 4,073,066, Cl. 34-73.000.

Dibler, Carson E., deceased; McDonald, Ruth, successor; and Cowan, Owen O., to McDonald, Ruth R., successor, assignment of Carson E. Dibler, deceased. Mobile self-propelled harvester. 4,073,392, Cl. 214-83.100.

Dick, Heinrich, to Voith Getriebe KG. Transmission-ratio-changer for multiple-transmission-ratio transmission arrangement. 4,073,204, Cl. 74-866.000.

Didier Engineering GmbH: *See*—
Protzl, Martin, 4,073,697, Cl. 202-254.000.

Dieck, Ronald L.; and Quinn, Edwin J., to Armstrong Cork Company. Polyphosphazene blends. 4,073,824, Cl. 260-823.000.

Dieck, Ronald L.; and Quinn, Edwin J., to Armstrong Cork Company. Polyphosphazene polymer/silicone rubber blends and foams therefrom. 4,073,825, Cl. 260-824.00R.

Diel, Roger L.: *See*—
Spata, James M.; and Diel, Roger L., 4,073,962, Cl. 426-646.000.

DiGiovanni, Francis J., Jr. Mausoleum and method of construction. 4,073,100, Cl. 52-79.300.

DiIanni, Daniel: *See*—
Brackmann, Warren A.; and DiIanni, Daniel, 4,073,850, Cl. 264-93.000.

Dingess, Billy, to Lester Construction Co. Car coupling. 4,073,507, Cl. 280-477.000.

Dionics, Inc.: *See*—
Kravitz, Bernard L., 4,074,293, Cl. 357-34.000.

Dippel, Heinz: *See*—
Ullrich, Hansjurgen; Dippel, Heinz; and Loss, Karl, 4,073,728, Cl. 210-71.000.

Dischert, Robert Adams; Hurst, Robert Norman; and Luther, Arch Clinton, Jr., to RCA Corporation. Signal processor using charge-coupled devices. 4,074,307, Cl. 358-8.000.

Ditcher, John, to A-Lok Corporation. Gasket seal between sewer pipe and manhole opening. 4,073,048, Cl. 29-450.000.

Dobner, Reinhold; and Hager, Walter, to Pfaff Industriemaschinen GmbH. Method for effecting the sewing of a pocket stitch. 4,073,252, Cl. 112-265.000.

Dobras, Bruce W., to Monarch Marking Systems, Inc. Bar code and method and apparatus for interpreting the same. 4,074,114, Cl. 235-463.000.

Dr. C. Otto & Comp. G.m.b.H.: *See*—
Gernhardt, Paul; Grams, Wolfgang; Danguillier, Wilhelm; and Pohl, Siegfried, 4,073,628, Cl. 48-62.00R.
Haese, Egon, 4,073,862, Cl. 423-220.000.
Ullrich, Hansjurgen; Dippel, Heinz; and Loss, Karl, 4,073,728, Cl. 210-71.000.

Dr. Madaus & Co.: *See*—
Valcavi, Umberto, 4,073,938, Cl. 424-317.000.

Doduco, Eugen Durrwachter: *See*—
Bollian, Erwin, 4,073,425, Cl. 228-116.000.

Doehlman, Harold G.: *See*—
Oder, Charles D.; and Doehlman, Harold G., 4,073,554, Cl. 312-199.000.

Doi, Tetsuo: *See*—
Kojima, Yasuyuki; Tanno, Kiyohiko; Doi, Tetsuo; and Ono, Kunio, 4,074,280, Cl. 346-76.00R.

Doi, Tsunesuke; Komoto, Hiroshi; Chono, Masazumi; Inoue, Akira; Saito, Kazuaki; and Shinozuka, Isao, to Asahi Kasei Kogyo Kabushiki Kaisha. Anti-corrosive agent for metals. 4,073,618, Cl. 21-2.70R.

Dolby Laboratories, Inc.: *See*—
Berkovitz, Robert Abraham; and Gundry, Kenneth James, 4,074,083, Cl. 179-100.1TD.

Dollar, David L.: *See*—
Scholes, Addison B.; and Dollar, David L., 4,073,966, Cl. 427-26.000.

Doman, Glidden S., to Gallagher, William. Damping mechanism for the rotor hub of a helicopter for ground resonance and waddle and its combination with the rotor. 4,073,600, Cl. 416-140.000.

Donermeyer, Donald D.: *See*—
Baatz, James C.; and Donermeyer, Donald D., 4,073,994, Cl. 428-265.000.
Baatz, James C.; and Donermeyer, Donald D., 4,073,995, Cl. 428-265.000.
Martins, Joseph G.; and Donermeyer, Donald D., 4,073,973, Cl. 427-142.000.

Donnelly Mirrors, Inc.: *See*—
Kamerling, Marc A.; Franks, Jeffrey L.; and Wilson, Harold R., 4,073,855, Cl. 264-249.000.

Dore, Alain; Picard, Jean; and Rochereau, Jacques, to Societe d'Applications Generales d'Electricite et de Mecanique (SAGEM). Device for reading displacements of a movable member. 4,074,258, Cl. 340-347.00P.

Dorner, Stefan: *See*—
Barleon, Leopold; Dorner, Stefan; Goetzmann, Odo; and Kussmaul, Guenter, 4,073,682, Cl. 176-38.000.

Dorr-Oliver Incorporated: *See*—
Steever, Andrew Beaumont; and Svencer, Richard Ernest, 4,073,064, Cl. 34-57.00A.

D'Orsay, James Alvin, to De Laval Separator Company, The. Swept surface heat exchanger. 4,073,339, Cl. 165-94.000.

Double E Company, Inc.: *See*—
Flagg, Richard Edward; and Potter, Blaine, 4,073,497, Cl. 279-2.00R.

Doubovetzky, Serge; Forschner, Peter; and Montazeau, Francois, to Societe Toulousaine de Produits Chimiques "Tolochimie". Process for the preparation of phosgene. 4,073,806, Cl. 260-544.00K.

Doumani, Charles, to Blue Cross Laboratories, Inc. Freeze-thaw stable emulsion cookware lubricant. 4,073,411, Cl. 222-192.000.

Doumani, Charles, to Blue Cross Laboratories, Inc. Emulsified cookware lubricant having freeze-thaw stability. 4,073,412, Cl. 222-192.000.

Dover Corporation: *See*—
Martens, Edward W., 4,073,034, Cl. 16-87.00B.

Dow Chemical Company, The: *See*—
Beale, Alvin Francis, Jr., 4,073,704, Cl. 204-70.000.
Begin, Louis E.; and Dunbar, Joseph E., 4,074,049, Cl. 544-82.000.
Caldwell, Donald Lee; and Fuchs, Raymond John, Jr., 4,073,873, Cl. 423-499.000.
Dupree, Wayne P.; and Brown, William F., Jr., 4,074,273, Cl. 346-34.000.
Greenawalt, Eddie Lee; and Geren, Lorenzo Dow, 4,073,121, Cl. 53-112.00A.
Smith, Layle V., 4,073,842, Cl. 264-53.000.

Dowrick, John Sidney, to Beecham Group Limited. Veterinary compo-

sition for the treatment of mammary disorder in animals. 4,073,920, Cl. 424-271.000.

Dragotinov, Alexander; and Hartmann, Harro Lothar, to Siemens Aktiengesellschaft. Method and switching arrangement for synchronizing oscillators of a digital telecommunication network. 4,074,080, Cl. 178-69.100.

Draper, Robert N., to Western Skyways, Inc. Fluid flow monitoring device. 4,073,189, Cl. 73-228.000.

Dreher, Manfrid. Centrifugal drum polishing machine. 4,073,095, Cl. 51-164.000.

Dresser Industries, Inc.: *See—*
Walters, D. F., 4,073,548, Cl. 308-8.200.

D'Silva, Themistocles D. J.: *See—*
Kurtz, Arthur Peter, Jr.; and D'Silva, Themistocles D. J., 4,073,930, Cl. 424-277.000.

Dudzinski, Stanley J., to Pittsburgh Corning Corporation. Method for capping cellular glass blocks for the load bearing insulation of liquefied gas storage tanks. 4,073,976, Cl. 427-181.000.

Duester, Everett L.: *See—*
Batts, John H.; and Duester, Everett L., 4,073,457, Cl. 248-340.000.

Duffee, Homer W.: *See—*
Richards, David O.; Jones, Isaac P.; Duffee, Homer W.; and Nutter, Charles E., 4,073,997, Cl. 428-285.000.

Dultgen, Gerd; and Schmidt, Wolfgang, to Bayer Aktiengesellschaft. Process for uniformly filling cavities with a foam insulating material. 4,073,841, Cl. 264-46.600.

Dumont, Maurice; and Marie, Gerard, to Commissariat a l'Energie Atomique. System for heating buildings. 4,073,434, Cl. 237-2.00B.

Dunbar, Joseph E.: *See—*
Begin, Louis E.; and Dunbar, Joseph E., 4,074,049, Cl. 544-82.000.

Duncan Electric Company, Inc.: *See—*
Milligan, James W., 4,074,221, Cl. 338-21.000.

Du Pont de Nemours, E. I., and Company: *See—*
Yates, Richard Alan, 4,073,956, Cl. 426-470.000.

Dupree, Wayne P.; and Brown, William F., Jr., to Dow Chemical Company, The. Sequential value multi-point recording device with unidirectional scan. 4,074,273, Cl. 346-34.000.

Durand, Harry Walter, to Grain Processing Corporation. Gum confections containing potato starch. 4,073,959, Cl. 426-578.000.

Durrer, Bernhard: *See—*
Niederost, Werner; and Durrer, Bernhard, 4,074,341, Cl. 361-331.000.

Dutartre, Maurice; and Roger, Yves, to Regie Nationale des Usines Renault. Device for cold forging the hollow, spherical heads of ball-joint pivots. 4,073,178, Cl. 72-352.000.

Duvall, David S.; Owczarski, William A.; Paulonis, Daniel F.; and Schaefer, Robert P., to United Technologies Corporation. Metallic filler material. 4,073,639, Cl. 75-.50R.

Duyckinck, Robert W.: *See—*
Reinauer, Thomas V.; Duyckinck, Robert W.; and Handwork, Frank B., 4,073,632, Cl. 55-374.000.

Dyckerhoff & Widmann Aktiengesellschaft: *See—*
Finsterwalder, Ulrich; and Seidl, Otto, 4,073,115, Cl. 52-745.000.

Dynamics Corporation of America: *See—*
Parzych, Joseph F., 4,074,162, Cl. 310-245.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Alfter, Franz-Werner; Breitscheidel, Hans-Ulrich; and Lorry, Cosmas, 4,073,535, Cl. 296-137.00A.
Franz, Arnold; and Kopnick, Siegfried, 4,074,015, Cl. 428-526.000.
Nestler, Heinz; and Plankl, Leo Hans, 4,073,972, Cl. 427-136.000.

Dzus Fastener Co., Inc.: *See—*
Gunther, Conrad J., 4,073,455, Cl. 248-291.000.

E. R. Squibb & Sons, Inc.: *See—*
Cilento, Rudolfo D.; and Hill, John Anthony, 4,073,861, Cl. 423-219.000.

E. + U. Gerstch AG, Ski-Produkte: *See—*
Gertsch, Ulrich, 4,073,509, Cl. 280-618.000.

Earls, David E.; and Nampoothiri, C. N. Damodaran, to General Time Corporation. Electronic chime and strike system. 4,073,133, Cl. 58-13.000.

East, Eldon Dwayne. Tubing deflector. 4,073,323, Cl. 141-326.000.

Eastman Kodak Company: *See—*
Musser, Harry Robert, 4,074,061, Cl. 560-193.000.
O'Neill, George J.; and Pacifici, James G., 4,073,777, Cl. 260-75.00S.
Wang, Richard H. S.; and Zannucci, Joseph S., 4,073,745, Cl. 252-403.000.

Eaton Corporation: *See—*
Tinholt, Thomas H., 4,073,370, Cl. 192-58.00B.

Eaton, James W.: *See—*
Clarke, John T.; Harker, Royce K.; Hittmeier, Michael E.; and Eaton, James W., 4,073,672, Cl. 156-219.000.

Ebihara, Heihachiro: *See—*
Sekiya, Fukuo; and Ebihara, Heihachiro, 4,074,256, Cl. 340-336.000.

Echeverria, Federico S.: *See—*
Carson, Chester C.; Barton, Sterling C.; and Echeverria, Federico S., 4,074,137, Cl. 250-380.000.

Edelman, William. Control apparatus for the automatic treatment of diabetes. 4,073,292, Cl. 128-214.00E.

Edenhofer, Bernd, to Ionit Anstalt Bernhard Berghaus. Arrangement for measuring temperatures of workpieces to be treated by glow discharge. 4,074,140, Cl. 250-492.00R.

Edholm, John H.: *See—*
Wolinski, Leon E.; Riebling, Richard G.; and Edholm, John H., 4,074,033, Cl. 526-47.000.

Edixhoven, Gerardus Hendrikus, to Hunter Douglas International N.V. Apparatus for assembling louvred blinds. 4,073,044, Cl. 29-24.500.

Edmonson, Douglas A.: *See—*
Hansen, Eldon D.; and Edmonson, Douglas A., 4,073,950, Cl. 426-128.000.

Edson, Harold C. Holder for artist paint tubes. 4,073,418, Cl. 224-45.00K.

Efremov, Petr Evgenievich: *See—*
Korshunov, Evgeny Alexeevich; Bainov, Nikolai Ivanovich; Petrov, Igor Nikolaevich; Konovalov, Georgy Fedorovich; Arshansky, Mikhail Iosipovich; Shmidt, Petr Genrikhovich; Kostrov, Valery Pavlovich; and Efremov, Petr Evgenievich, 4,073,333, Cl. 164-66.000.

Eggleton, Reginald C.; and Williamson, Warren L., to Indianapolis Center for Advanced Research. Peak detector for resolution enhancement of ultrasonic visualization systems. 4,074,223, Cl. 340-1.00R.

Egnaczak, Raymond K.: *See—*
Teumer, Roger G.; Warter, Peter J., Jr.; Squassoni, Gino F.; Tulagin, Vseevolod; and Egnaczak, Raymond K., 4,073,583, Cl. 355-3.00P.

Eguchi, Yasukata, to Janome Sewing Machine Co., Ltd. Intermittent stitching device of sewing machines. 4,073,253, Cl. 112-275.000.

Eheim, Franz, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,073,277, Cl. 123-139.0BD.

Ehrsam, William Friedrich; Meyer, Carl H. W.; Smith, John Lynn; and Tuchman, Walter Leonard, to International Business Machines Corporation. Message verification and transmission error detection by block chaining. 4,074,066, Cl. 178-22.000.

Eichelberger, Charles W.: *See—*
Butler, Walter J.; and Eichelberger, Charles W., 4,074,260, Cl. 340-347.0CC.

Eicker, Rolf: *See—*
Solf, Johannes; and Eicker, Rolf, 4,073,058, Cl. 30-257.000.

Eidenschink, Rudolf: *See—*
Erdmann, Dietrich; Eidenschink, Rudolf; Krause, Joachim; and Pohl, Ludwig, 4,073,742, Cl. 252-299.000.

Eidsmo, Arne; and Lofmark, Bengt Gustav, to Telefonaktiebolaget L M Ericsson. Pilot receiver memory unit in a carrier frequency system. 4,074,073, Cl. 179-15.0BP.

Eimers, Erich; Margotte, Dieter; Schmid, Helmut; and Dhein, Rolf, to Bayer Aktiengesellschaft. Esters of phosphorous acid. 4,073,769, Cl. 260-45.80R.

Eisai Co., Ltd.: *See—*
Kawashima, Hidetoshi; Ohtake, Shinzaburo; Fujimori, Toru; Ohkawa, Isao; and Tajima, Tetsuya, 4,073,910, Cl. 424-266.000.
Yasuda, Koichi; Ikeda, Yusuke; and Nishida, Yukiaki, 4,073,883, Cl. 424-94.000.

Eisenhower, Walter D.: *See—*
Paivinen, John O.; and Eisenhower, Walter D., 4,074,301, Cl. 357-23.000.

Eisert, Manfred; and Schmeidl, Karl, to BASF Aktiengesellschaft. Auramine salts. 4,074,060, Cl. 560-149.000.

Eklof, Ake Torsten; Fengsborn, Per Tage Allan; and Romell, Gunnar Vigg Riss, to Atlas Copco Aktiebolag. Device for damping the recoil of a work tool connected to a percussion tool. 4,073,350, Cl. 173-139.000.

Ekstrom, Bo: *See—*
Steinert, Wolfgang; and Ekstrom, Bo, 4,074,119, Cl. 364-807.000.

Electric Fuel Propulsion Corporation: *See—*
Aronson, Robert R., 4,074,021, Cl. 429-51.000.

Electrostatic Equipment Company: *See—*
Means, Eldon A.; and McMahon, Roy C., 4,073,712, Cl. 204-186.000.

Elger, Walter: *See—*
Skuballa, Werner; Raduechel, Bernd; Vorbrueggen, Helmut; Elger, Walter; Loge, Olaf; and Schillinger, Eckehard, 4,073,934, Cl. 424-305.000.

Eliades, Theo Ioannou; and Ramirez, Noemi Bernardo, to Surpass Chemicals Limited. Nitrite based rust inhibitor complex. 4,073,744, Cl. 252-389.00R.

Ell, William M. Selector. 4,074,116, Cl. 235-83.000.

Eller, J. Marlin. Pumping installation. 4,073,606, Cl. 417-424.000.

Elliott, James P.: *See—*
Hunt, Paul S.; Elliott, James P.; Gulich, Johann F.; Weber, Max H.; Yampolsky, Jack S.; and Lockett, George E., 4,073,267, Cl. 122-32.000.

Elliott, Robert L., to Exxon Research & Engineering Co. Hydrogenated copolymers of conjugated dienes and when desired a vinyl aromatic monomer are useful as oil additives. 4,073,737, Cl. 252-51.50A.

Ellis, James B., to Fibreboard Corporation. Adjustable clamping device. 4,073,317, Cl. 138-147.000.

Endo, Hiroshi: *See—*
Fujiki, Norio; and Endo, Hiroshi, 4,073,359, Cl. 180-98.000.

Endo, Kunio, to Nippondenso Co., Ltd. Electronically-controlled fuel injection system. 4,073,270, Cl. 123-32.0EB.

Energetics Science, Inc.: *See—*
Blurton, Keith F.; and Stetter, Joseph R., 4,073,698, Cl. 204-1.00T.

Energy Absorption Systems: *See—*
Seegmiller, Wan; and Young, Bruce O., 4,073,482, Cl. 267-139.000.

Energy Research: *See—*
Davis, Gilbert E., 4,073,216, Cl. 91-480.000.

Engelhard Minerals & Chemicals Corporation: *See—*
Pfefferle, William C.; and Hettinger, William P., Jr., 4,073,716, Cl. 208-66.000.

Engleway Corporation: *See*—
Vandeweghe, Joseph L., 4,074,225, Cl. 340-237.00R.

English Electric Valve Co., Ltd.: *See*—
Scoles, Graham John, 4,074,202, Cl. 328-258.000.

Epsztein, Bernard; and Kantorowicz, Gerard, to Thomson-CSF. Elastic bulk wave frequency filter. 4,074,213, Cl. 333-71.000.

Erdco Engineering Corporation: *See*—
Bogen, John S.; and Robin, Gary I., 4,074,243, Cl. 340-237.00R.

Erdmann, Dietrich; Eidenschink, Rudolf; Krause, Joachim; and Pohl, Ludwig, to Merck Patent Gesellschaft mit beschrankter Haftung. Cyano-substituted biphenyl compounds and liquid crystalline dielectrics containing the same. 4,073,742, Cl. 252-299.000.

Erickson, John W.; and Williams, Carter P., to Kobe, Inc. Lubricant cooling for high-speed pitot pump. 4,073,596, Cl. 415-180.000.

Erwin, Curtis L., Jr. Flow meter and metering systems. 4,073,186, Cl. 73-114.000.

Erwin, Robert L. Rotary plug valve. 4,073,468, Cl. 251-77.000.

Esanu, Andre, to Societe d'Etudes de Produits Chimiques. Isopropylamino pyrimidine orthophosphate. 4,073,895, Cl. 424-200.000.

Esch, Erich: *See*—
Schmidt, Manfred; Freitag, Dieter; Fries, Hermann; and Esch, Erich, 4,073,757, Cl. 260-19.00R.

Escher Wyss Limited: *See*—
Christ, Alfred; Lehmann, Rolf; and Miller, Helmut, 4,073,549, Cl. 308-9.000.
Fanta, Peter, 4,073,731, Cl. 210-376.000.

Esco Corporation: *See*—
Miller, Franklin L., 4,073,042, Cl. 24-241.00P.

Essel, Albert E., deceased; and by Essel, Virginia G., executrix. Snowplow blade extension. 4,073,077, Cl. 37-50.000.

Essel, Virginia G., executrix: *See*—
Essel, Albert E., deceased; and Essel, Virginia G., executrix, 4,073,077, Cl. 37-50.000.

Essex Group, Inc.: *See*—
Kaduki, Charles L.; and Stoneking, Richard D., 4,073,611, Cl. 431-45.000.

Estes, Roger Q. Disposable noise reducing hearing aid attachment. 4,073,366, Cl. 181-158.000.

Etablissements Leroux S.A.: *See*—
Leroux, Serge Andre, 4,073,177, Cl. 72-339.000.

Etienne, Arlette Therese, to Centre de Recherches Metallurgiques Centrum Voor Research in de Metallurgie. Method of controlling continuous casting of a metal. 4,073,332, Cl. 164-4.000.

Eue, Ludwig: *See*—
Regel, Erik; Eue, Ludwig; and Schmidt, Robert R., 4,073,636, Cl. 71-92.000.

Evenson, Gerald Norman; and Moffett, Robert Bruce, to Upjohn Company, The. Certain as-triazino [4,3-a][1,4]benzodiazepine derivatives. 4,073,785, Cl. 260-243.300.

Everett, Charles J.: *See*—
Conklin, Robert M.; Everett, Charles J.; and Human, Arthur T., 4,074,246, Cl. 340-274.00R.

Exxon Research & Engineering Co.: *See*—
Elliott, Robert L., 4,073,737, Cl. 252-51.50A.
Hamner, Glen P., 4,073,718, Cl. 208-80.000.
Malachesky, Paul A.; and Newman, Gerald H., 4,074,019, Cl. 429-50.000.
Mayer, Ivan, 4,073,822, Cl. 260-683.470.
Powers, Kenneth W.; and Kuntz, Irving, 4,074,035, Cl. 526-185.000.
Saidla, Glen E. W., 4,073,840, Cl. 264-45.300.
Siskin, Michael, 4,073,821, Cl. 260-683.470.
Yates, David J. C.; and Murrell, Lawrence L., 4,073,750, Cl. 252-459.000.

Fahey, Thomas D.; and Schlagel, Samuel, to Steel Storage Systems, Inc. Apparatus for racking steel and the like. 4,073,382, Cl. 211-1.000.

Fahim, Mostafa S. Method of male contraception for domestic mammals having a scrotum. 4,073,289, Cl. 128-24.00A.

Fahnenstich, Rudolf: *See*—
Bertram, Heidrun; Fahnenstich, Rudolf; Offermanns, Heribert; and Tanner, Herbert, 4,073,945, Cl. 426-2.000.

Fair, Samuel S., to Sandgrabber, Inc. Shore erosion control structure. 4,073,145, Cl. 61-4.000.

Fairchild Industries, Inc.: *See*—
Smallwood, John J., 4,073,313, Cl. 137-625.600.

Falconer, David Duncan; and Weinstein, Stephen Brant, to Bell Telephone Laboratories, Incorporated. Joint adaptive echo canceller and equalizer for two-wire full-duplex data transmission. 4,074,086, Cl. 179-170.200.

Fan, Lo Cheng: *See*—
Hearon, William Montgomery; and Fan, Lo Cheng, 4,073,804, Cl. 260-534.00R.

Fansteel Inc.: *See*—
Keifert, Hibbard G.; and Jenstrom, Einar R., 4,073,427, Cl. 228-165.000.

Fanta, Peter, to Escher Wyss Limited. Push-type centrifuge. 4,073,731, Cl. 210-376.000.

Farrar, Edward L., Jr. Pelvic traction belt. 4,073,290, Cl. 128-75.000.

Fassbender, Rolf: *See*—
Lang, Armin; and Fassbender, Rolf, 4,073,140, Cl. 60-405.000.

Faucz, Eugene C.: *See*—
Haas, Werner E. L.; and Faucz, Eugene C., 4,074,276, Cl. 346-74.100.

Favreau, Michel; and Vidal, Serge, to Thomson-CSF. Arrangement for projecting images of markers on to a photosensitive surface in a telecine equipment. 4,073,586, Cl. 355-20.000.

Favron, Sergio, to de Taddeo, Giancarlo. Artificial bait for fishing. 4,073,084, Cl. 43-42.350.

Feather, Jack Vincent. Body attached restraining type exercising device. 4,073,490, Cl. 272-136.000.

Feilchenfeld, Max Hans, to Yissum Research Development Co. of the Hebrew Univ.; and Israel Chemicals Ltd. Oxidation of magnesium chloride. 4,073,875, Cl. 423-504.000.

Fein, Marvin Michael; Patnaik, Birendra Kumar; and Chu, Frank K. Y., to Dart Industries, Inc. Organic borate coupling agents. 4,073,766, Cl. 260-42.140.

Feldberg, Murray: *See*—
O'Rourke, James; and Feldberg, Murray, 4,073,229, Cl. 100-98.00R.

Feldmesser, Julius: *See*—
Thompson, Malcolm J.; Feldmesser, Julius; and Robbins, William E., 4,073,939, Cl. 424-320.000.

Fengsborn, Per Tage Allan: *See*—
Eklof, Ake Torsten; Fengsborn, Per Tage Allan; and Romell, Gunnar Vigg Riss, 4,073,350, Cl. 173-139.000.

Ferrarini, James; and Kuehn, Erich, to ICI Americas Inc. Ethylenically unsaturated monomer solutions containing urylated linear polyester/-polyurethane resins. 4,073,828, Cl. 260-859.00R.

Ferro Corporation: *See*—
Heasley, James H., 4,073,568, Cl. 350-103.000.

Ferro Manufacturing Corporation: *See*—
Pickles, Joseph, 4,073,459, Cl. 248-394.000.

Ferrous Corporation: *See*—
Simmons, Richard W., 4,073,626, Cl. 44-57.000.

Feschenko, Ninel Gavrilovna: *See*—
Kandul, Jury Vasilievich; Semeny, Valery Yakovlevich; Pivovarov, Mikhail Danilovich; Malovik, Vladlen Vasilievich; Mazepa, Ivan Karpovich; and Feschenko, Ninel Gavrilovna, 4,073,809, Cl. 260-606.50P.

Fest, Christa; Hammann, Ingeborg; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. O-alkyl-O-[4-lepidin(6)yl]-(thiono)(thiol) phosphoric (phosphonic) acid esters and arthropodicidal compositions thereof. 4,073,893, Cl. 424-200.000.

Fibreboard Corporation: *See*—
Ellis, James B., 4,073,317, Cl. 138-147.000.

Fielder, Coy M.: *See*—
Rowley, David S.; Walker, Bruce H.; Fielder, Coy M.; and Rohde, Heino J., 4,073,354, Cl. 175-329.000.

Fields, Ellis K.: *See*—
Cerefice, Steven A.; and Fields, Ellis K., 4,073,794, Cl. 260-326.00C.

Fine, Mary Jane: *See*—
Brown, Glendon W.; Fine, Mary Jane; and Hill, Larry O., 4,073,748, Cl. 252-428.000.

Fink, Wolfgang; and Graf, Peter, to Siemens Aktiengesellschaft. Non-mechanical printer operating in accordance with an electrographic process. 4,074,283, Cl. 346-139.00C.

Finsterwalder, Ulrich; and Seidl, Otto, to Dyckerhoff & Widmann Aktiengesellschaft. Process for the production of a bridge girder sectional cantilever construction. 4,073,115, Cl. 52-745.000.

Fishbaugh, Byron L.; Keller, Harold E.; and Stewart, Lionel G., to Goodyear Tire & Rubber Company, The. Method of making vibration damper. 4,073,047, Cl. 29-450.000.

Fisher, John Sergio. Premanufactured modular town house building construction. 4,073,102, Cl. 52-79.130.

Fisher, Michael H.; and Ruyle, William V., to Merck & Co., Inc. 1-Substitutedphenyl-4(1H)-pyridinone hydrazones. 4,073,791, Cl. 260-294.80R.

Fishman, Herbert: *See*—
Shorr, Jacob; and Fishman, Herbert, 4,073,730, Cl. 210-321.00R.

Fitch, Scott McDowell: *See*—
Caputo, Salvatore; Fitch, Scott McDowell; Harris, Cliff Andrew; Kuhar, John, Jr.; Pappas, Andrew Leo; and Redlich, Wayne, 4,074,358, Cl. 364-514.000.

Flagg, Richard Edward; and Potter, Blaine, to Double E Company, Inc. Care chuck stop assembly. 4,073,497, Cl. 279-2.00R.

Flaherty, John J., to Magnaflux Corporation. Conductivity measuring instrument having linearization means and a digital read-out. 4,074,186, Cl. 324-222.000.

Flanigen, Edith Marie; and Patton, Robert Lyle, to Union Carbide Corporation. Silica polymorph and process for preparing same. 4,073,865, Cl. 423-339.000.

Fleischmann, Martin; Goodridge, Francis; and Vance, Christopher John, to National Research Development Corporation. Electrochemical cells. 4,073,702, Cl. 204-59.00R.

Fleming, Robert W.; Sill, Arthur D.; and Sweet, Francis W., to Richardson-Merrell, Inc. Bis-basic ethers of 2,6,-and 2,7-dihydroxyanthraquinones. 4,073,904, Cl. 424-248.580.

Flexibox Limited: *See*—
Bury, Norman Albert, 4,073,161, Cl. 64-13.000.

Flink, Sune Natanael: *See*—
Collin, Per Harald; Flink, Sune Natanael; Widell, Bjorn; Hirsch, Martin; and Reh, Lothar, 4,073,642, Cl. 75-35.000.

Florens, Raymond Leopold, to AFGA-Gevaert N.V. Direct-positive silver halide emulsions. 4,073,652, Cl. 96-101.000.

Florjancic, Dusan: *See*—
Schiele, Otto; and Florjancic, Dusan, 4,073,595, Cl. 415-143.000.

Flottweg-Werk Dr. Georg Bruckmayer GmbH & Co. KG: *See*—
Jager, Ernst Adolf, 4,073,431, Cl. 233-7.000.

Fluid Kinetics, Inc.: *See*—
Gardner, James J.; and Koppehele, Hugh Paul, 4,073,409, Cl. 222-146.0HE.

Fly, Howard G. Portable animal hospital table. 4,073,240, Cl. 108-20.000.

FMC Corporation: *See—*
Crawford, Donald C., 4,073,223, Cl. 93-93.0HT.
Meadow, Morton; and Berkowitz, Sidney, 4,073,868, Cl. 423-443.000.

Foam Cutting Engineers, Inc.: *See—*
Pettingell, Winslow L., 4,073,979, Cl. 427-244.000.

Focht, Bruce E., to Scott Paper Company. Perforated, embossed film to foam laminates having good acoustical properties and the process for forming said. 4,073,991, Cl. 428-138.000.

Foley, Lawrence E., Jr. Oil field pig launcher and receiver. 4,073,303, Cl. 137-15.000.

Ford Aerospace & Communications Corporation: *See—*
Haas, Ronald J.; and Briggs, Donald C., 4,074,018, Cl. 429-21.000.

Ford, Michael Alan, to Perkin-Elmer Limited. Apparatus for changing the speed ratio between first and second displaceable members. 4,073,198, Cl. 74-360.000.

Forman, Ladislav; Mergl, Milos; Mostecky, Jiri; Teply, Milos; and Uher, Jiri, to Vysoka skola chemicko-technologicka. Process for the preparation of a proteinaceous concentrate. 4,073,688, Cl. 195-49.000.

Forsberg, Gunnar Stefan, to Telefonaktiebolaget L M Ericsson. Interference resistant phase-locked loop. 4,074,207, Cl. 331-1.00A.

Forschner, Peter: *See—*
Doubovetzky, Serge; Forschner, Peter; and Montazeau, Francois, 4,073,806, Cl. 260-544.00K.

Fort, Pierre Henri Marie; and Pierrel, Michel, to Pont-A-Mousson S.A. Cooling device for iron pipe centrifugal casting machine. 4,073,335, Cl. 164-154.000.

Fortune, William J., to Great Ideas Corporation. Snow plow blade guard. 4,073,076, Cl. 37-42.0VL.

Foster Grant Co., Inc.: *See—*
Smith, Stuart Bruce, 4,073,843, Cl. 264-53.000.

Fox, Charles W., to McCabe-Powers Body Company. Control system for an aerial device. 4,074,234, Cl. 340-171.00R.

Fox, Jack Jay: *See—*
Watanabe, Kyoichi Aloisius; Chu, Chung Kwang; and Fox, Jack Jay, 4,074,042, Cl. 536-1.000.

Fox, Wayne S., to Kawasaki Motors Corporation, U.S.A. Internal combustion engine shut-off device. 4,073,279, Cl. 123-198.0DC.

Foxton, Michael W.; Gregory, Gordon I.; and Rogers, David M., to Glaxo Laboratories Limited. 7[2-(Aminocarbonylalkoxyimino)acetamido] derivatives of cephalosporin. 4,074,047, Cl. 544-30.000.

Frank, Louis N., to Kranco, Inc. Overhead crane with redundant safety features. 4,073,476, Cl. 254-184.000.

Frank Mayer & Associates, Inc.: *See—*
Crosslen, Louis John, 4,073,557, Cl. 312-284.000.

Frank, Raymond C.; and Frank, Ronald R. Retractable step. 4,073,502, Cl. 280-166.000.

Frank, Ronald R.: *See—*
Frank, Raymond C.; and Frank, Ronald R., 4,073,502, Cl. 280-166.000.

Franklin, Dwaine R. Arrow quiver. 4,073,328, Cl. 150-1.50R.

Franks, Jeffrey L.: *See—*
Kamerling, Marc A.; Franks, Jeffrey L.; and Wilson, Harold R., 4,073,855, Cl. 264-249.000.

Franz, Arnold; and Kopnick, Siegfried, to Dynamit Nobel Aktiengesellschaft. Process for the production of nonflammable laminated materials. 4,074,015, Cl. 428-526.000.

Fraser, Arthur D.; and Inglis, Dwight A., to Harold, Raymond D. Irrigation apparatus. 4,073,309, Cl. 137-344.000.

Fraser, Peter. Lightweight waterbed assembly. 4,073,019, Cl. 5-365.000.

Frederick, Cecil S.: *See—*
Gratsch, Jack M.; and Frederick, Cecil S., 4,073,206, Cl. 83-489.000.

Freeway Corporation: *See—*
Sutowski, Walter S., 4,073,551, Cl. 308-195.000.

Freilich, John Douglas, to Glyco Chemicals, Inc. Di-quaternary ammonium salts of hydantoin and compositions thereof. 4,073,927, Cl. 424-273.00R.

Freilich, John Douglas: *See—*
Sonntag, Norman O. V.; and Freilich, John Douglas, 4,073,926, Cl. 424-273.00R.

Freitag, Dieter: *See—*
Schmidt, Manfred; Freitag, Dieter; Fries, Hermann; and Esch, Erich, 4,073,757, Cl. 260-19.00R.

French, Sidney J.: *See—*
Cornforth, John W.; Schofield, John A.; French, Sidney J.; and Gray, Robin T., 4,073,815, Cl. 260-619.00A.

Frieder, Phillip M.: *See—*
Welsh, Robert C., 4,073,578, Cl. 351-167.000.

Friedrich, Hans, to Siemens Aktiengesellschaft. Apparatus for adjusting a semiconductor wafer by electron beam illumination. 4,073,990, Cl. 428-138.000.

Fries, Hermann: *See—*
Schmidt, Manfred; Freitag, Dieter; Fries, Hermann; and Esch, Erich, 4,073,757, Cl. 260-19.00R.

Fritsch, Ronald J.: *See—*
Bischof, John F.; and Fritsch, Ronald J., 4,074,091, Cl. 200-50.00A.

Fritsch, Walter; and Melcher, Gerhard, to Klockner-Humboldt-Deutz Aktiengesellschaft. Process of smelting sulphidic copper ore concentrates. 4,073,645, Cl. 75-74.000.

Frohberger, Paul-Ernst: *See—*
Buchel, Karl Heinz; Frohberger, Paul-Ernst; and Kaspers, Helmut, 4,073,901, Cl. 424-245.000.

Frohlich, Sigurd. Watch case construction. 4,073,132, Cl. 58-23.0BA.

Frus, John R.: *See—*
Kuo, Benjamin C.; Frus, John R.; and Singh, Gurdial, 4,074,179, Cl. 318-696.000.

Fuchs, Raymond John, Jr.: *See—*
Caldwell, Donald Lee; and Fuchs, Raymond John, Jr., 4,073,873, Cl. 423-499.000.

Fuhrer, Esther Claire: *See—*
Baker, Daniel, deceased; and Borst, Alan W., 4,074,153, Cl. 310-12.000.

Fuji Jukogyo Kabushiki Kaisha: *See—*
Murota, Kozo; Matsumoto, Rempei; Yasuma, Toru; Morinaga, Mamoru; Tajima, Shigeo; Nakamura, Masayuki; and Sakaguchi, Akira, 4,073,361, Cl. 181-228.000.

Fuji Photo Film Co.: *See—*
Noguchi, Masaru, 4,073,566, Cl. 350-3.710.

Fuji Photo Film Co., Ltd.: *See—*
Fujita, Susumu; and Kushibe, Seijiro, 4,074,294, Cl. 354-106.000.
Maekawa, Yukio, 4,073,781, Cl. 260-152.000.
Miyamoto, Akio; Matsukawa, Hiroharu; and Kobayashi, Teruo, 4,073,968, Cl. 427-54.000.
Munakata, Tsuneaki; and Kuboshima, Makoto, 4,074,296, Cl. 354-187.000.

Fuji Photo Optical Co., Ltd.: *See—*
Suzuki, Ryotaro, 4,074,286, Cl. 354-21.000.
Yamagishi, Akira, 4,073,573, Cl. 350-187.000.

Fujii, Hiroshi: *See—*
Tsuchiya, Yoshimasa; and Fujii, Hiroshi, 4,073,520, Cl. 292-216.000.

Fujikake, Kenji; Amaki, Isamu; and Suzuki, Masatoshi, to Toyota Chuo Kenkyusho. Heat exchangers. 4,073,338, Cl. 165-86.000.

Fujiki, Norio; and Endo, Hiroshi, to Nissan Motor Company, Limited. Braking system for avoiding a collision of a vehicle with an obstacle thereof. 4,073,359, Cl. 180-98.000.

Fujimori, Toru: *See—*
Kawashima, Hidetoshi; Ohtake, Shinzaburo; Fujimori, Toru; Ohkawa, Isao; and Tajima, Tetsuya, 4,073,910, Cl. 424-266.000.

Fujimoto, Yoshiji: *See—*
Yajima, Shunichi; Kakumoto, Shigeru; Fujimoto, Yoshiji; and Hananoi, Toshihiro, 4,074,231, Cl. 340-146.3AG.

Fujino, Masahiko; Wakimasu, Mitsuhiro; Taketomi, Shigehisa; and Ishikawa, Eiichiro, to Takeda Chemical Industries, Ltd. Novel polypeptides. 4,073,890, Cl. 424-177.000.

Fujita, Hisaya; Kaieda, Nobuo; Sato, Setsuo; and Kawakami, Kenji, to Yokogawa Electric Works, Ltd. Multipoint recorder. 4,074,274, Cl. 346-34.000.

Fujita, Kazunori: *See—*
Takeuchi, Seiji; Fujita, Kazunori; and Shimokobe, Ikuo, 4,073,725, Cl. 210-31.00C.

Fujita, Susumu; and Kushibe, Seijiro, to Fuji Photo Film Co., Ltd. Data recording means for photographic camera. 4,074,294, Cl. 354-106.000.

Fujitsu Limited: *See—*
Mochida, Yukou; Ogawa, Tadao; and Yamaguchi, Kazuo, 4,074,127, Cl. 250-199.000.
Otomo, Koju; Itoh, Takeshi; Hayashi, Kazuyuki; Omoto, Hiroshi; Yui, Takayuki; and Suzuki, Makoto, 4,074,232, Cl. 340-147.00R.

Fujiwara, Shinobu: *See—*
Masumura, Hitoshi; Fujiwara, Shinobu; and Tanaka, Hitoshi, 4,073,846, Cl. 264-65.000.

Fukuda, Hitoshi: *See—*
Minehisa, Setsuzi; Inui, Tatuo; and Fukuda, Hitoshi, 4,074,105, Cl. 219-137.800.

Fukushima, Ichiro: *See—*
Imai, Kiyoshi; Hasebe, Nobuyuki; Asami, Tomiaki; Soga, Setsuo; Fukushima, Ichiro; and Asahina, Yasuo, 4,074,001, Cl. 428-329.000.

Fukushima, Seitaro, to Mitsubishi Kinzoku K.K. Recovery of chlorine from iron chloride. 4,073,874, Cl. 423-500.000.

Fulkerson, Emmet M., to General Electric Company. Opto-electronic position sensing method. 4,074,104, Cl. 219-121.0LM.

Fulmer, Leon F., Sr., to Shakespeare Company. Vehicular antenna hold down bracket. 4,073,417, Cl. 224-42.10G.

Fulmer Research Institute: *See—*
Brook, Greville Bertram; Bowyer, William Henry; and Desforges, Charles Desmond, 4,073,400, Cl. 220-63.00R.

Funk, Erwin D., to Kamyr Inc. Coal gasification process with improved procedure for continuously discharging ash particles and apparatus therefor. 4,073,629, Cl. 48-77.000.

Furukawa, Kazunori: *See—*
Wada, Motomu; Inoue, Masakazu; Furukawa, Kazunori; and Matsubara, Shigeyoshi, 4,073,844, Cl. 264-55.000.

Furuya, Tadashi, to Nippon Electric Company, Ltd. System for suppressing sideband components of angle-modulated wave. 4,074,198, Cl. 325-3.000.

Futsuhara, Natsuko: *See—*
Yamaki, Naoomi; Futsuhara, Natsuko; Masuda, Kazue; and Tsuchimoto, Koji, 4,073,866, Cl. 423-405.000.

G.A.O. Gesellschaft fur Automation und Organisation mbH: *See—*
Schirrmeister, Harry; and Haberstroh, Markus, 4,073,487, Cl. 271-64.000.

G. D. Searle & Co.: *See—*
Coppell, Stephen M.; and Harrow, Terence A., 4,073,807, Cl. 260-562.00N.

Gabriel, Edwin Zenith. Punched-card programmable analog computer. 4,074,113, Cl. 235-419.000.

Galantay, Eugene E.; and Kathawala, Faizulla G., to Sandoz, Inc. Hypolipidemic allene carboxylic esters. 4,073,936, Cl. 424-308.000.
Galkiewicz, Thomas M.; Petersen, Kenneth C.; and Sullivan, John L., to Schenectady Chemicals, Inc. Tackifiers for elastomers. 4,073,776, Cl. 260-51.0EP.
Galkiewicz, Thomas M.; Petersen, Kenneth C.; and Sullivan, John L., to Schenectady Chemicals, Inc. Tackifiers for elastomers. 4,073,826, Cl. 260-831.000.
Gallagher, William: *See—*
Doman, Glidden S., 4,073,600, Cl. 416-140.000.
Garab, H. Gary, to Albany International Corporation. Auto crucible for metering and transferring liquid metals. 4,073,414, Cl. 222-602.000.
Gardner, James J.; and Koppehele, Hugh Paul, to Fluid Kinetics, Inc. Hot melt dispenser with removeable pump in follower. 4,073,409, Cl. 222-146.0HE.
Garin, Paul V.: *See—*
Biaggini, Benjamin F.; and Garin, Paul V., 4,073,394, Cl. 214-145.00R.
Garrett Corporation, The: *See—*
Parker, Kenneth O., 4,073,340, Cl. 165-166.000.
Garrett-Weldco Industries, Inc.: *See—*
Schmidt, Wilhelm, 4,073,364, Cl. 180-139.000.
Garrigues, Yves G., to Groupement Europeen de la Cellulose. Process for the oxidation of waste liquors arising from the manufacture of paper pulp. 4,073,727, Cl. 210-63.00R.
Garskamp, Arnoldus, to U.S. Philips Corporation. Receiver tuning circuit. 4,074,216, Cl. 334-15.000.
Gasser, Rupert Josef; and Huster, Lienhard Bodo, to Societe d'Assistance Technique pour Produits Nestle, S.A. Bouillon base. 4,073,961, Cl. 426-589.000.
Gates, Geoffrey Steven: *See—*
Bradley, William E.; and Gates, Geoffrey Steven, 4,073,287, Cl. 128-2.00R.
Gaus, Harry, to Braun A.G. Supersonic signal linearizes loudspeaker operation. 4,074,070, Cl. 179-1.00D.
Gausepohl, Hermann: *See—*
Naarmann, Herbert; Penzien, Klaus; and Gausepohl, Hermann, 4,074,032, Cl. 526-44.000.
Gebauer, Gerhard; Brandrup, Johannes; Kraft, Kurt; and Mayer, Franz, to Hoechst Aktiengesellschaft. Coating composition. 4,074,007, Cl. 428-411.000.
Gefvert, Karl Ivan: *See—*
Carlsson, Eric; Gefvert, Karl Ivan; Hjalmarsson, Thomas; Kerff, Anton; Pejchal, Karel; and Wide, Lars, 4,073,450, Cl. 242-131.000.
General Atomic Company: *See—*
Brown, Stanley J.; and Gorholt, Wilhelm, 4,073,685, Cl. 176-87.000.
Glazar, James M.; and Hoffmann, Erich H. P., 4,073,681, Cl. 176-36.00R.
Mysels, Karol J., 4,073,834, Cl. 264-0.500.
General Electric Company: *See—*
Banucci, Eugene G.; and Mellinger, Gary A., 4,073,773, Cl. 260-47.0CP.
Boldebuck, Edith M.; and Gorowitz, Bernard, 4,074,006, Cl. 428-379.000.
Born, Norman E.; and Kolatorowicz, Edwin E., 4,074,175, Cl. 318-332.000.
Borom, Marcus P., 4,073,662, Cl. 134-2.000.
Butler, Walter J.; and Eichelberger, Charles W., 4,074,260, Cl. 340-347.0CC.
Carson, Chester C.; Barton, Sterling C.; and Echeverria, Federico S., 4,074,137, Cl. 250-380.000.
Collins, David J., 4,073,184, Cl. 73-37.600.
Devine, Thomas M., Jr., 4,073,426, Cl. 228-122.000.
Fulkerson, Emmet M., 4,074,104, Cl. 219-121.0LM.
Harris, Samuel C., Jr.; and Hanger, William A., 4,074,128, Cl. 250-205.000.
Hunt, Paul S.; Elliott, James P.; Gulich, Johann F.; Weber, Max H.; Yampolsky, Jack S.; and Lockett, George E., 4,073,267, Cl. 122-32.000.
Katchman, Arthur; and Lee, Gim Fun, Jr., 4,073,765, Cl. 260-40.00R.
Kinson, Philip L.; and Quinn, Clayton B., 4,073,814, Cl. 260-619.00A.
Mark, Victor, 4,073,768, Cl. 260-45.70S.
Nash, Dudley O.; and Clayton, Thomas S., 4,073,441, Cl. 239-265.410.
Peterson, Marvin A., 4,073,788, Cl. 260-29.20N.
Powers, Robert W., 4,073,711, Cl. 204-181.00F.
Quinn, Clayton B., 4,073,774, Cl. 260-47.0UA.
Schaeffer, Robert L.; and Maher, William M., 4,073,056, Cl. 30-123.500.
Strong, Herbert M.; and Tuft, Roy E., 4,073,380, Cl. 206-219.000.
Turnbull, Fred G., 4,074,339, Cl. 361-239.000.
Weischedel, Richard C., 4,074,182, Cl. 323-25.000.
Will, Fritz G., 4,074,028, Cl. 429-105.000.
General Mills Chemicals, Inc.: *See—*
Jones, Duane A.; and Jordan, Wesley A., 4,074,043, Cl. 536-52.000.
General Time Corporation: *See—*
Earls, David E.; and Nampoothiri, C. N. Damodaran, 4,073,133, Cl. 58-13.000.
George, Jimmie; and Tyson, Charles P. Adjustable trailer hitch. 4,073,508, Cl. 280-478.00R.
Gerding, Charles Christian, to Jones & Laughlin Steel Corporation. Tilting tundish. 4,073,334, Cl. 164-87.000.
Geren, Lorenzo Dow: *See—*
Greenawalt, Eddie Lee; and Geren, Lorenzo Dow, 4,073,121, Cl. 53-112.00A.
Gernhardt, Paul; Grams, Wolfgang; Danguillier, Wilhelm; and Pohl, Siegfried, to Dr. C. Otto & Comp. G.m.b.H. Control system for apparatus to gasify fine-grain fuels in a reactor. 4,073,628, Cl. 48-62.00R.
Gertsch, Ulrich, to E. + U. Gerstch AG, Ski-Produkte. Safety ski binding. 4,073,509, Cl. 280-618.000.
Gesellschaft fuer Kernforschung: *See—*
Barleon, Leopold; Dorner, Stefan; Goetzmann, Odo; and Kussmaul, Guenter, 4,073,682, Cl. 176-38.000.
Gewerkschaft Eisenhutte Westfalia: *See—*
Harmsma, Gunter, 4,073,151, Cl. 61-45.00D.
Kauter, Hans, 4,073,149, Cl. 61-45.00D.
Stuckmann, Dieter; and Jutte, Hans, 4,073,153, Cl. 61-85.000.
Ghiringhelli, Giovanni: *See—*
D'Arrigo, Sebastiano; and Ghiringhelli, Giovanni, 4,074,334, Cl. 361-79.000.
Giammarco, Giuseppe; and Giammarco, Paolo. Regeneration of absorbent solutions used for removing gaseous acid impurities from gaseous mixtures. 4,073,863, Cl. 423-222.000.
Giammarco, Paolo: *See—* .
Giammarco, Giuseppe; and Giammarco, Paolo, 4,073,863, Cl. 423-222.000.
Gianessi, Albert, to Caterpillar Tractor Co. Restraint assembly for a tractor hood. 4,073,524, Cl. 292-341.120.
Gibson, Keith C.: *See—*
Marshall, Joseph W.; and Gibson, Keith C., 4,073,173, Cl. 72-250.000.
Gibson, Sandra F., to McDonnell Douglas Corporation. *Citrobacter freundii* broth. 4,073,690, Cl. 195-100.000.
Gibson, Walter Gold, to RCA Corporation. Delay line network for processing a composite electrical signal. 4,074,308, Cl. 358-38.000.
Giddings & Lewis, Inc.: *See—*
Olig, Eugene A., 4,074,177, Cl. 318-602.000.
Giese, Erik O.: *See—*
Gross, Alexander Louis; and Giese, Erik O., 4,073,072, Cl. 36-44.000.
Gilbert, Richard, to Stanley Tools Limited. Folding blade knife. 4,073,057, Cl. 30-153.000.
Gillette Company, The: *See—*
Pentney, Harry, 4,073,407, Cl. 221-102.000.
Girling Limited: *See—*
Bayliss, John Patrick, 4,073,546, Cl. 303-115.000.
Glaxo Laboratories Limited: *See—*
Foxton, Michael W.; Gregory, Gordon I.; and Rogers, David M., 4,074,047, Cl. 544-30.000.
Glazar, James M.; and Hoffmann, Erich H. P., to General Atomic Company. Nuclear reactor shutdown system. 4,073,681, Cl. 176-36.00R.
Glenn, Edward R. Carburator. 4,073,278, Cl. 123-198.00F.
Glenn, Thomas J.: *See—*
Way, Allan S.; Glenn, Thomas J.; Sloane, Howard J.; and Keahl, Gerald T., 4,074,272, Cl. 346-33.00A.
Glover, William, to Baker Perkins Holdings Limited. Wrapping machines. 4,073,116, Cl. 53-182.00R.
Glyco Chemicals, Inc.: *See—*
Freilich, John Douglas, 4,073,927, Cl. 424-273.00R.
Sonntag, Norman O. V., 4,073,924, Cl. 424-273.00R.
Sonntag, Norman O. V.; and Freilich, John Douglas, 4,073,926, Cl. 424-273.00R.
Go, Santos W., to Owens-Illinois, Inc. Terephthalic acid/P,P-sulfonyldibenzoic acid/ethylene glycol/neopentyl glycol polyester compositions and containers made therefrom. 4,073,949, Cl. 426-106.000.
Godberson, Gary L.: *See—*
Godberson, Harold W.; and Godberson, Gary L., 4,073,592, Cl. 404-89.000.
Godberson, Harold W.; and Godberson, Gary L. Method of paving. 4,073,592, Cl. 404-89.000.
Goetzinger, John W.: *See—*
Whisman, Marvin L.; Reynolds, James W.; Goetzinger, John W.; and Cotton, Faye O., 4,073,719, Cl. 208-180.000.
Whisman, Marvin L.; Goetzinger, John W.; and Cotton, Faye O., 4,073,720, Cl. 208-180.000.
Goetzmann, Odo: *See—*
Barleon, Leopold; Dorner, Stefan; Goetzmann, Odo; and Kussmaul, Guenter, 4,073,682, Cl. 176-38.000.
Goldschmidt, Wilbur Harry; Henning, Hansjuergen Hermann; and Kapes, William John, Jr., to Bell Telephone Laboratories, Incorporated. Light emitting diode array imaging system - parallel approach. 4,074,319, Cl. 358-230.000.
Goloff, Alexander, to Caterpillar Tractor Co. Light-weight piston assemblies. 4,073,221, Cl. 92-221.000.
Goncalves, Antonin L., to L'Oreal. Container for storing two products separately and dispensing a mixture thereof. 4,073,406, Cl. 222-94.000.
Goodman, David S.: *See—*
Anhalt, John W.; Goodman, David S.; and Peterson, Carl W., 4,073,560, Cl. 339-99.00R.
Goodridge, Francis: *See—*
Fleischmann, Martin; Goodridge, Francis; and Vance, Christopher John, 4,073,702, Cl. 204-59.00R.
Goodwin, Charles M. Electrically and manually actuatable door locking structure. 4,073,518, Cl. 292-144.000.

Goodwin, Robert J., to C. H. Heist Corporation. Lance tip construction. 4,073,026, Cl. 15-104.10R.
Goodyear Tire & Rubber Company, The: *See—*
Burkholder, Theodore B.; Stalter, Robert J.; and Skotynsky, Paul N., 4,073,839, Cl. 264-45.100.
Chung, Daniel A., 4,073,858, Cl. 264-262.000.
Fishbaugh, Byron L.; Keller, Harold E.; and Stewart, Lionel G., 4,073,047, Cl. 29-450.000.
Stalter, Robert J.; and Burkholder, Theodore B., 4,073,020, Cl. 5-355.000.
Wang, Jin-Liang; Brown, Melvin; and Menapace, Henry R., 4,073,820, Cl. 260-683.00D.
Gordon, John S.: *See—*
Hart, Charles G.; Gordon, John S.; and Sorenson, Richard D., 4,073,375, Cl. 198-466.000.
Gordon, Steven R., to Van Hoose, Fred C., a part interest. Chain link fence straightener. 4,073,475, Cl. 254-66.000.
Gorholt, Wilhelm: *See—*
Brown, Stanley J.; and Gorholt, Wilhelm, 4,073,685, Cl. 176-87.000.
Gorlin, Samuil Matusovich: *See—*
Slezinger, Isaak Isaevich; Babkin, Gennady Fedotovich; Gorlin, Samuil Matusovich; and Belyaeva, Regina Valentinovna, 4,073,188, Cl. 73-147.000.
Gorowitz, Bernard: *See—*
Boldebuck, Edith M.; and Gorowitz, Bernard, 4,074,006, Cl. 428-379.000.
Gosau, Dieter, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Apparatus for delaying the pressure drop in pressurized cabins or the like especially in an emergency. 4,073,452, Cl. 244-118.00R.
Gosselin, Robert George: *See—*
Wallace, Edward Morris; and Gosselin, Robert George, 4,073,059, Cl. 30-261.000.
Goudriaan, Frans: *See—*
Kanbier, Dirk; and Goudriaan, Frans, 4,073,721, Cl. 208-251.00H.
Gould Inc.: *See—*
Yahraus, William A., 4,073,550, Cl. 308-23.000.
Graf, Peter: *See—*
Fink, Wolfgang; and Graf, Peter, 4,074,283, Cl. 346-139.00C.
Grain Processing Corporation: *See—*
Durand, Harry Walter, 4,073,959, Cl. 426-578.000.
Witt, Paul R., Jr., 4,073,947, Cl. 426-13.000.
Grams, Wolfgang: *See—*
Gernhardt, Paul; Grams, Wolfgang; Danguillier, Wilhelm; and Pohl, Siegfried, 4,073,628, Cl. 48-62.00R.
Grand Prix of America, Inc.: *See—*
DeLorean, Jack Z.; and Bacon, David C., 4,074,117, Cl. 235-92.00T.
Grandjacques, Francois: *See—*
Montanteme, Jean; Greffe, Andre; and Grandjacques, Francois, 4,073,641, Cl. 75-11.000.
Graphic Systems, Inc.: *See—*
Belanger, Raymond Francis, 4,074,285, Cl. 354-15.000.
Grataloup, Xavier Roger, to Societe Anonyme Dite: Nodet-Gougis. Method and apparatus for pneumatically spreading particulate substances. 4,073,439, Cl. 239-655.000.
Gratsch, Jack M.; and Frederick, Cecil S., to Cutters Machine Company, Inc. Long-handled cutting apparatus for a cloth spreading machine. 4,073,206, Cl. 83-489.000.
Graves, Kenny M.: *See—*
Brady, Jack D.; and Graves, Kenny M., 4,073,631, Cl. 55-97.000.
Gray, Michael James; and Stanton, Raymond E., to Gray and Stanton. Binder-substrate analyzer. 4,073,620, Cl. 23-253.00R.
Gray, Robin T.: *See—*
Cornforth, John W.; Schofield, John A.; French, Sidney J.; and Gray, Robin T., 4,073,815, Cl. 260-619.00A.
Gray and Stanton: *See—*
Gray, Michael James; and Stanton, Raymond E., 4,073,620, Cl. 23-253.00R.
Gray Tool Company: *See—*
Karlskind, Neil, 4,073,562, Cl. 339-117.00P.
Great Ideas Corporation: *See—*
Fortune, William J., 4,073,076, Cl. 37-42.0VL.
Green, George Edward, to Ciba-Geigy Corporation. Epoxide resins. 4,074,008, Cl. 428-418.000.
Green, George H.: *See—*
Maginnes, Edward A.; Brooks, Eyrle E.; Haukeness, Maynard O.; and Green, George H., 4,073,089, Cl. 47-17.000.
Greenawalt, Eddie Lee; and Geren, Lorenzo Dow, to Dow Chemical Company, The. Form, fill and seal industrial bag machine. 4,073,121, Cl. 53-112.00A.
Grefco, Inc.: *See—*
Raabe, Paul J.; and Tarbell, Harlan E., 4,073,673, Cl. 156-244.000.
Greffe, Andre: *See—*
Montanteme, Jean; Greffe, Andre; and Grandjacques, Francois, 4,073,641, Cl. 75-11.000.
Gregg Engineering Corporation: *See—*
Gregoire, Clyde G.; Hartman, James A.; and Gregoire, Milton J., 4,073,485, Cl. 270-21.000.
Gregge, William C.: *See—*
Hutchinson, Harold D.; and Gregge, William C., 4,074,097, Cl. 200-81.90R.
Gregoire, Clyde G.; Hartman, James A.; and Gregoire, Milton J., to Gregg Engineering Corporation. Apparatus for making multiple page printed booklets. 4,073,485, Cl. 270-21.000.
Gregoire, Milton J.: *See—*
Gregoire, Clyde G.; Hartman, James A.; and Gregoire, Milton J., 4,073,485, Cl. 270-21.000.
Gregory, Gordon I.: *See—*
Foxton, Michael W.; Gregory, Gordon I.; and Rogers, David M., 4,074,047, Cl. 544-30.000.
Greve, Peter Ferdinand: *See—*
Velzel, Christiaan Hendrik Frans; and Greve, Peter Ferdinand, 4,074,314, Cl. 358-128.000.
Griffey, Donald E., to Matsushita Electric Industrial Co., Ltd. Television receiver protection system. 4,074,323, Cl. 358-243.000.
Griffin, Alvin G. Test piece gripping device. 4,073,185, Cl. 73-103.000.
Grill, Helmut; Zschocke, Rainer Hans; Wagner, Josef; Hofrichter, Gernot; and Janiak, P. Stefan, to Klinge Pharma GmbH & Co. Substituted propanol-(2)-derivatives and their nicotinic acid esters, and process for their preparation, and the use thereof as hypolipemic drugs. 4,073,935, Cl. 424-308.000.
Grimaldi, Frank G.: *See—*
Dechene, Ronald L.; Grimaldi, Frank G.; and Newton, Robert E., 4,074,184, Cl. 324-30.00R.
Grimstedt, Harry Evert: *See—*
Margen, Peter Heinrich Erwin; Grimstedt, Harry Evert; and Bosaeus, Jan Anders, 4,073,045, Cl. 29-157.30C.
Grinberg, Jan; and Miller, Leroy J., to Hughes Aircraft Company. Circularly polarized light source. 4,073,571, Cl. 350-337.000.
Gropper, Hans: *See—*
Oeder, Dieter; Gropper, Hans; and Urban, Friedrich, 4,074,040, Cl. 526-352.000.
Grosinger, Matityahu; and Salomon, Mordechai. Locking mechanism. 4,073,195, Cl. 74-25.000.
Gross, Alexander Louis; and Giese, Erik O., to Comfort Products, Inc. Air circulation shoe material. 4,073,072, Cl. 36-44.000.
Gross, Friedrich: *See—*
Beck, Theodor; and Gross, Friedrich, 4,073,889, Cl. 424-164.000.
Groth, Roger L.; Harvey, Randall L.; Lauer, Thomas R.; and Ronnebaum, Morris L., to Iowa State Univ. Research Foundation, Inc. Combination tractor and farm implement hitch means. 4,073,346, Cl. 172-439.000.
Groupement Europeen de la Cellulose: *See—*
Garrigues, Yves G., 4,073,727, Cl. 210-63.00R.
Grow, Donald G. Vehicle entry way elevator step. 4,073,501, Cl. 280-164.00R.
Grundstrom, Robert Ronnie; and Baylis, Arthur. Locking device for keyholes. 4,073,165, Cl. 70-371.000.
Grunwell, Joyce F.; and Johnston, John O., to Richardson-Merrell, Inc. Method of terminating pregnancy. 4,073,899, Cl. 424-238.000.
Grutsch, James F.; Mallatt, Russell C.; and Steely, Benjamin F., to Standard Oil Company (Indiana). Process for the purification of waste water. 4,073,722, Cl. 210-5.000.
GTE Sylvania Incorporated: *See—*
Benda, David; and Reigel, Franklin G., 4,073,558, Cl. 316-18.000.
Buljan, Sergej Tomislav; and Stermer, Philip Eli, 4,073,845, Cl. 264-65.000.
Lennon, Thomas J., 4,074,201, Cl. 325-363.000.
Nordberg, Svein T.; and Shaner, Donald R., 4,074,219, Cl. 337-186.000.
Pitel, Ira Jay, 4,074,344, Cl. 363-44.000.
Webb, Edward A.; Barakitis, Nikolaos; and Pigott, Keith, 4,074,166, Cl. 313-185.000.
Gudermuth, Clyde S., Jr.: *See—*
Kruder, George A.; and Gudermuth, Clyde S., Jr., 4,074,362, Cl. 366-82.000.
Guenther, William D., to Dana Corporation. Piston assembly. 4,073,220, Cl. 92-190.000.
Guiller, Jacques. Apparatus for freezing small drops of liquid. 4,073,158, Cl. 62-266.000.
Gulas, Hans-Jurgen; and Neuper, Helmut, to Veitscher Magnesitwerke-Actien-Gesellschaft. Fired refractory brick and process for preparing the same. 4,073,656, Cl. 106-57.000.
Gulich, Johann F.: *See—*
Hunt, Paul S.; Elliott, James P.; Gulich, Johann F.; Weber, Max H.; Yampolsky, Jack S.; and Lockett, George E., 4,073,267, Cl. 122-32.000.
Gundry, Kenneth James: *See—*
Berkovitz, Robert Abraham; and Gundry, Kenneth James, 4,074,083, Cl. 179-100.1TD.
Gunther, Conrad J., to Dzus Fastener Co., Inc. Tiltable bracket. 4,073,455, Cl. 248-291.000.
Gupta, Rash B.; and Armstrong, David L., to Westinghouse Electric Corporation. Analog control and digital system with integrated interface for electric power and other plants. 4,074,357, Cl. 364-494.000.
Gupta, Vijai P., to Halcon International, Inc. Preparation of glycol esters. 4,073,876, Cl. 423-508.000.
Gurule, Marcelo. Door latch securing device. 4,073,525, Cl. 292-346.000.
Gutjahr, Rolf, to Otto Durr, Firma. Method and device for drying surface treated, especially varnished objects. 4,073,063, Cl. 34-32.000.
Guzek, David Thaddeus, to Abbott Laboratories. Stabilized aminophylline solution and process therefor. 4,073,907, Cl. 424-253.000.
Gwatkin, James deGoulard, III: *See—*
Blake, Roy Baxter, Jr.; Gwatkin, James deGoulard, III; Magee, Judy Pat; and Porter, Glendon Russell, 4,074,087, Cl. 179-170.200.
H. C. Price Co.: *See—*
Harris, Robert J.; and Sikes, Gail T., 4,073,760, Cl. 260-28.5AS.

H. Eicker & Sohne: *See—*
Solf, Johannes; and Eicker, Rolf, 4,073,058, Cl. 30-257.000.

H. Wilson Corporation: *See—*
Wilson, Harry Howard, Jr., 4,073,556, Cl. 312-250.000.

Haarmann, Walter: *See—*
Kummer, Werner; Koppe, Herbert; Stahle, Helmut; and Haarmann, Walter, 4,073,905, Cl. 424-248.560.

Haas, Billie G.; and Haas, Carol B. Coupling assembly for submarine casing sections. 4,073,511, Cl. 285-3.000.

Haas, Carol B.: *See—*
Haas, Billie G.; and Haas, Carol B., 4,073,511, Cl. 285-3.000.

Haas, Ronald J.; and Briggs, Donald C., to Ford Aerospace & Communications Corporation. Secondary fuel cell. 4,074,018, Cl. 429-21.000.

Haas, Werner E. L.; and Faucz, Eugene C., to Xerox Corporation. Magnetic imaging system using heat. 4,074,276, Cl. 346-74.100.

Haberli, Roland: *See—*
Lacroix, Roger; and Haberli, Roland, 4,073,615, Cl. 8-25.000.

Haberstroh, Markus: *See—*
Schirrmeister, Harry; and Haberstroh, Markus, 4,073,487, Cl. 271-64.000.

Hack, Joachim; Schaefer, Dieter; and Motz, Herbert, to BASF Aktiengesellschaft. Magnetic recording media having a low coefficient of friction. 4,074,002, Cl. 428-331.000.

Haditsch, Werner; Rutz, Hansruedi; and Toplak, Ernst, to BBC Brown Boveri & Company Limited. Internally air cooled exciter-current lead-through bolt interconnecting rotor shaft-enclosed lead-in conductor bar and terminal conductor bar leading to rotor winding. 4,074,155, Cl. 310-59.000.

Haese, Egon, to Dr. C. Otto & Comp. G.m.b.H. Process for removing ammonia, hydrogen sulfide and hydrocyanic acid from gases. 4,073,862, Cl. 423-220.000.

Hagborg, Winston E.: *See—*
Moore, Ricky L.; and Hagborg, Winston E., 4,074,005, Cl. 428-378.000.

Hager, Walter: *See—*
Dobner, Reinhold; and Hager, Walter, 4,073,252, Cl. 112-265.000.

Hakansson, Ivan: *See—*
Wretlind, Karl Arvid Johannes; Ljungberg, Stellan; Hakansson, Ivan; and Ajaxon, Bengt Magnus, 4,073,943, Cl. 424-358.000.

Hala, Alfred A., to Hohmann & Barnard, Inc. Wedge shaped lock washer construction and assembly. 4,073,329, Cl. 151-20.000.

Halcon International, Inc.: *See—*
Gupta, Vijai P., 4,073,876, Cl. 423-508.000.

Hall, Bobby E., to Halliburton Company. Methods for treating subterranean formations. 4,073,344, Cl. 166-307.000.

Hall, John B.; Sprecker, Mark A.; Schmitt, Frederick Louis; and Vock, Manfred Hugo, to International Flavors & Fragrances Inc. 1-Acetyl-3,3-dimethyl-(2-propenyl)cyclohexane perfume compositions. 4,073,751, Cl. 252-522.000.

Hall, Melvin R.: *See—*
Boatman, Roger M.; and Hall, Melvin R., 4,074,188, Cl. 324-52.000.

Hall, Roger D., to Bendix Corporation, The. Varactor frequency multiplier and switching circuit. 4,074,347, Cl. 363-158.000.

Halliburton Company: *See—*
Hall, Bobby E., 4,073,344, Cl. 166-307.000.

Hamada, Yoshikazu: *See—*
Kurozu, Toshio; and Hamada, Yoshikazu, 4,073,519, Cl. 292-216.000.

Hamanaka, Ernest S.; and Stam, John G., to Pfizer Inc. Broad spectrum antibiotics. 4,073,783, Cl. 260-239.100.

Hameyer, Klaus: *See—*
Ciaccio, Leonard L.; and Hameyer, Klaus, 4,073,692, Cl. 195-103.50R.

Hamilton Construction Co.: *See—*
Peckham, William T., 4,073,025, Cl. 14-2.400.

Hamilton, Willard C.: *See—*
Scouten, Charles G.; and Hamilton, Willard C., 4,073,649, Cl. 96-1.400.

Hamma, Gerhard: *See—*
Linka, Adolf; and Hamma, Gerhard, 4,073,319, Cl. 139-134.000.

Hammann, Ingeborg: *See—*
Fest, Christa; Hammann, Ingeborg; and Homeyer, Bernhard, 4,073,893, Cl. 424-200.000.

Hammersburg, Don D. Universal support pads for wheelchair. 4,073,537, Cl. 297-384.000.

Hamming, Richard Wesley; and Kaiser, James Frederick, to Bell Telephone Laboratories, Incorporated. Multisection filter using inflected amplitude change function to sharpen its band-edge responses. 4,074,212, Cl. 333-70.00T.

Hammond, Jack A.; and Karter, Elias M., to Westvaco Corporation. High yield semichemical wood pulping process. 4,073,678, Cl. 162-19.000.

Hamner, Glen P., to Exxon Research & Engineering Co. Process for the hydroconversion and hydrodesulfurization of heavy feeds and residua. 4,073,718, Cl. 208-80.000.

Hamuro, Yukihiko: *See—*
Kawamatsu, Yutaka; Saraie, Takahiro; Imamiya, Eiko; and Hamuro, Yukihiko, 4,074,057, Cl. 560-55.000.

Hananoi, Toshihiro: *See—*
Yajima, Shunichi; Kakumoto, Shigeru; Fujimoto, Yoshiji; and Hananoi, Toshihiro, 4,074,231, Cl. 340-146.3AG.

Handa, Susumu; Tanaka, Yoshiaki; Nishihata, Atsushi; Ueda, Sadashi; Inamoto, Yoshiaki; Tanimoto, Fumio; and Kitano, Hisao, to Kao Soap Co., Ltd. Process for preparation of isocyanuric acid triesters. 4,074,052, Cl. 544-221.000.

Handtmann, Albert: *See—*
Muller, Johann; Weerth, Hans Ernst; and Staudenrausch, Georg, 4,073,039, Cl. 17-1.00F.

Handwork, Frank B.: *See—*
Reinauer, Thomas V.; Duyckinck, Robert W.; and Handwork, Frank B., 4,073,632, Cl. 55-374.000.

Hanger, William A.: *See—*
Harris, Samuel C., Jr.; and Hanger, William A., 4,074,128, Cl. 250-205.000.

Hankee, Roy H.; and Akman, Alp T., to Xerox Corporation. Pressure sensitive adhesive drafting films for use in electrostatographic copiers. 4,074,000, Cl. 428-323.000.

Hansen, Arne; and Troup, George, to Chemetron Corporation. Cylinder valve for gas fire extinguishing system. 4,073,464, Cl. 251-26.000.

Hansen, Eldon D.; and Edmonson, Douglas A., to Pillsbury Company, The. Easy opening spirally wound dough can. 4,073,950, Cl. 426-128.000.

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Harada, Akikazu, to Hitachi, Ltd. Magnetron with harmonic frequency output suppression. 4,074,169, Cl. 315-39.750.

Harakawa, Hiroshi: *See—*
Kishi, Hidehiro; Harakawa, Hiroshi; Ogawa, Kazuo; and Tsutsui, Seiko, 4,073,782, Cl. 260-23.00H.

Hardwick, John F., to Burroughs Corporation. Method and apparatus for recording and reproducing information on a plural-track record disk. 4,074,328, Cl. 360-77.000.

Harker, Royce K.: *See—*
Clarke, John T.; Harker, Royce K.; Hittmeier, Michael E.; and Eaton, James W., 4,073,672, Cl. 156-219.000.

Harms, Arie Anthonie; and Wark, Johan Gerrit, to U.S. Philips Corporation. Carrier with code. 4,074,189, Cl. 324-73.00R.

Harmsma, Gunter, to Gewerkschaft Eisenhutte Westfalia. Mine roof support assemblies. 4,073,151, Cl. 61-45.00D.

Harnsberger, Bobby G., to Texaco Inc. Sand consolidation method. 4,073,342, Cl. 166-295.000.

Harnsberger, Bobby G., to Texaco Inc. Sand consolidation method. 4,073,343, Cl. 166-295.000.

Harold, Raymond D.: *See—*
Fraser, Arthur D.; and Inglis, Dwight A., 4,073,309, Cl. 137-344.000.

Harper, Stanley Bernard: *See—*
Hinchcliffe, Dennis; Daisley, Robert Thomas; Harper, Stanley Bernard; and Kilborn, Hilary Mark How'l, 4,073,374, Cl. 198-425.000.

Harrington, Earl J., to Overhead Conveyor Company. Power and free conveyor system. 4,073,236, Cl. 104-172.00S.

Harrington Manufacturing Company: *See—*
Jordan, Bertram Lee; and Mitchell, John Davis, 4,073,124, Cl. 56-1.000.
Jordan, Bertram Lee; and Mitchell, John Davis, 4,073,378, Cl. 198-627.000.

Harris, Cliff Andrew: *See—*
Caputo, Salvatore; Fitch, Scott McDowell; Harris, Cliff Andrew; Kuhar, John, Jr.; Pappas, Andrew Leo; and Redlich, Wayne, 4,074,358, Cl. 364-514.000.

Harris, Edward, to Koppers Company, Inc. Press disc valve. 4,073,470, Cl. 251-163.000.

Harris, Robert J.; and Sikes, Gail T., to H. C. Price Co. Method of packaging asphalt material and improved product resulting therefrom. 4,073,760, Cl. 260-28.5AS.

Harris, Samuel C., Jr.; and Hanger, William A., to General Electric Company. Photoelectric signal generating circuits. 4,074,128, Cl. 250-205.000.

Harrison, George W.; and Moore, Billie G. Method and apparatus for sealing a pipeline leak. 4,073,836, Cl. 264-36.000.

Harrow, Terence A.: *See—*
Coppell, Stephen M.; and Harrow, Terence A., 4,073,807, Cl. 260-562.00N.

Hart, Charles G.; Gordon, John S.; and Sorenson, Richard D., to Hayssen Manufacturing Company. Method of and apparatus for feeding randomly received items. 4,073,375, Cl. 198-466.000.

Hart, David Gerald, to Sangamo Electric Company. Keyless unidirectional reset for cumulative demand register. 4,074,192, Cl. 324-103.00R.

Hart, James E., to Westinghouse Air Brake Company. Continual quick service valve device. 4,073,544, Cl. 303-83.000.

Hartdegen, Frank Joseph; and Abdo, Kamal Mohammad, to W. R. Grace & Co. Promotion of feed efficiency. 4,073,884, Cl. 424-94.000.

Hartless, Ray Lawson; and Trozzolo, Anthony Marion, to Bell Telephone Laboratories, Incorporated. Stabilized polymeric composition and product using same. 4,073,771, Cl. 260-45.9NC.

Hartley, Justin. Burglar alarm for use with an automatic garage door opener. 4,074,269, Cl. 343-225.000.

Hartman, James A.: *See—*
Gregoire, Clyde G.; Hartman, James A.; and Gregoire, Milton J., 4,073,485, Cl. 270-21.000.

Hartmann, Harro Lothar: *See—*
Dragotinov, Alexander; and Hartmann, Harro Lothar, 4,074,080, Cl. 178-69.100.

Hartmann, Ludwig Albert; and West, Richard Lowell, to ICI Americas Inc. Process for the preparation and purification of 3-(4-lithiosulfophenoxy)-1,2-propanediol. 4,073,802, Cl. 260-512.00R.

Hartwig, Peter Rudolf, to Schloemann-Siemag Aktiengesellschaft. Apparatus for mixing plastics. 4,073,408, Cl. 222-145.000.

Harvey, Randall L.: *See—*
Groth, Roger L.; Harvey, Randall L.; Lauer, Thomas R.; and Ronnebaum, Morris L., 4,073,346, Cl. 172-439.000.

Hasebe, Nobuyuki: *See—*
Imai, Kiyoshi; Hasebe, Nobuyuki; Asami, Tomiaki; Soga, Setsuo; Fukushima, Ichiro; and Asahina, Yasuo, 4,074,001, Cl. 428-329.000.

Hasenbalg, Ralph D., to Vector General, Inc. Vector generator. 4,074,359, Cl. 364-521.000.

Hashimoto, Kametaro; Ushitani, Kenji; Serino, Yoichi; and Arakawa, Tadaoki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Poppet valve. 4,073,474, Cl. 251-368.000.

Hashimoto, Kozo: *See—*
Otake, Hiroshi; Koresawa, Saburo; and Hashimoto, Kozo, 4,074,210, Cl. 333-29.000.

Hashimoto, Shinichiro: *See—*
Tokura, Yoichi; and Hashimoto, Shinichiro, 4,074,069, Cl. 179-1.0SC.

Hashimoto, Shintaro: *See—*
Washizuka, Isamu; Hashimoto, Shintaro; and Katsui, Saburo, 4,074,118, Cl. 364-712.000.

Hattori, Masaichi: *See—*
Takeda, Nobuhiro; Hattori, Masaichi; Kondo, Minoru; and Kato, Tatsuo, 4,074,226, Cl. 340-52.00B.

Hauge, Stein. Outdoor surface compositions. 4,073,753, Cl. 260-2.300.

Haukeness, Maynard O.: *See—*
Maginnes, Edward A.; Brooks, Eyrle E.; Haukeness, Maynard O.; and Green, George H., 4,073,089, Cl. 47-17.000.

Haupin, Warren E.: *See—*
Kinosz, Donald L.; and Haupin, Warren E., 4,073,703, Cl. 204-70.000.

Hauri, Jacques: *See—*
Charransol, Pierre; Hauri, Jacques; and Athenes, Claude, 4,074,077, Cl. 179-15.0AT.

Hause, Arthur Dickson: *See—*
Christensen, Carl; Hause, Arthur Dickson; and McDonald, Henry Stanton, 4,074,072, Cl. 179-15.0AQ.

Havalda, Paul, to Ciba-Geigy Corporation. Method and apparatus for reducing liquid content of filter cakes. 4,073,065, Cl. 34-71.000.

Hayakawa, Toshio: *See—*
Mitsugi, Itaru; and Hayakawa, Toshio, 4,074,089, Cl. 200-5.00E.

Hayashi, Kazuyuki: *See—*
Otomo, Koju; Itoh, Takeshi; Hayashi, Kazuyuki; Omoto, Hiroshi; Yui, Takayuki; and Suzuki, Makoto, 4,074,232, Cl. 340-147.00R.

Hayashi, Minoru; Ogino, Mineo; Kobayashi, Toshihiko; and Noda, Masaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Distributor rotor electrode having silicon coating for suppressing peaks of capacity discharge current. 4,074,090, Cl. 200-19.0DR.

Hayden Trans-Cooler, Inc.: *See—*
Vian, David Roy; and Price, Stephen Glenn, 4,073,512, Cl. 285-12.000.

Hayssen Manufacturing Company: *See—*
Hart, Charles G.; Gordon, John S.; and Sorenson, Richard D., 4,073,375, Cl. 198-466.000.

Hazemeijer B.V.: *See—*
Pullen, Albert, 4,074,098, Cl. 200-144.00R.

Headrick, John Charles: *See—*
Womack, William B. M.; Starnes, Ralph Emory, Jr.; Headrick, John Charles; and Martin, Ronald Ray, 4,073,978, Cl. 427-235.000.

Hearon, William Montgomery; and Fan, Lo Cheng, to Boise Cascade Corporation. Producing glycine by the reductive amination of glyoxylic acid. 4,073,804, Cl. 260-534.00R.

Heasley, James H., to Ferro Corporation. Retroreflector units with three mutually perpendicular surfaces defining a trihedral angle of a rectangular parallelepiped. 4,073,568, Cl. 350-103.000.

Hecken, Wilfried: *See—*
Mikule, Jiri; and Hecken, Wilfried, 4,073,310, Cl. 137-389.000.

Heid, Christian; and Polster, Johannes, to Cassella Farbwerke Mainkur Aktiengesellschaft. Oxidative after-treatment of materials dyed or printed with sulfur or vat dyestuffs. 4,073,616, Cl. 8-34.000.

Heikkinen, Duane G.; and Kanten, Thomas M., to Minnesota Mining and Manufacturing Company. Fine-metal-particle-based magnetic recording medium of improved environmental stability. 4,074,012, Cl. 428-425.000.

Heiliger, Leonard R.: *See—*
Wakeman, Alden H.; and Heiliger, Leonard R., 4,073,605, Cl. 417-283.000.

Heilmann, Steven M.: *See—*
Bateson, George F.; Brown, Francis W.; and Heilmann, Steven M., 4,074,004, Cl. 428-355.000.

Heinecke, Rudolf August Herbert; and Ashcroft, Geoffrey Laurence, to ITT Industries, Incorporated. Plasma etching. 4,073,669, Cl. 156-643.000.

Heintz, Clifford E., to A-T-O Inc. Cobalt oxide chlorate candle. 4,073,741, Cl. 252-187.00R.

Heinzelmann, Max; Rohloff, Fritz; and Schuren, Hans, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Apparatus for determining the dose equivalent of neutrons. 4,074,136, Cl. 250-392.000.

Heitzman, Gary N.; and Shook, Norma G., to Caterpillar Tractor Co. Composite U Joint guard-step. 4,073,591, Cl. 403-24.000.

Hemmerich, Heinz-Peter; Winter, Gerhard; Rosenkranz, Hans Jurgen; and Woditsch, Peter, to Bayer Aktiengesellschaft. Degradable plastic composition. 4,073,764, Cl. 260-37.00N.

Henderson, Terry L.: *See—*
Willson, Robert D.; and Henderson, Terry L., 4,073,194, Cl. 73-646.000.

Hendren, Gilbert T., Jr.: *See—*
Dell, Basil, 4,073,196, Cl. 74-52.000.

Hendricks, Leonard Monroe. Potato spiral cutter. 4,073,060, Cl. 30-279.00R.

Hengartner, Urs Oskar: *See—*
Batcho, Andrew David; Hengartner, Urs Oskar; Leimgruber, Willy; Scott, John William; and Valentine, Donald, Jr., 4,073,795, Cl. 260-326.14T.

Henkel KGaA: *See—*
Koch, Karlheinz; Kolaczinski, Gerhard; Rupilius, Wolfgang; and Stein, Werner, 4,074,013, Cl. 428-457.000.

Henkel u. Cie GmbH: *See—*
Roebke, Wolfgang; Kneitel, Dieter; and Parr, Erfried, 4,073,867, Cl. 423-429.000.

Hennen, Hans: *See—*
Optiz, Wolfgang; and Hennen, Hans, 4,073,871, Cl. 423-481.000.

Henning, Hansjuergen Hermann: *See—*
Goldschmidt, Wilbur Harry; Henning, Hansjuergen Hermann; and Kapes, William John, Jr., 4,074,319, Cl. 358-230.000.

Henny Penny Corporation: *See—*
King, James D., 4,074,108, Cl. 219-214.000.

Henry Soss and Company: *See—*
Curry, Edward G.; and Sanders, Vernard W., 4,073,037, Cl. 16-169.000.
Curry, Edward G.; and Sanders, Vernard W., 4,073,038, Cl. 16-189.000.

Henry, Tim Warren, to Motorola, Inc. Auto-polarity dual ramp analog to digital converter. 4,074,257, Cl. 340-347.0NT.

Henzl, Jerry. Trash compactor. 4,073,228, Cl. 100-52.000.

Hercules Incorporated: *See—*
Hopler, Robert Bartley, Jr., 4,073,235, Cl. 102-22.000.

Hermann Hemscheidt Maschinenfabrik: *See—*
Welzel, Josef, 4,073,150, Cl. 61-45.00D.

Herrmann, Gunther, to Kollmorgen Technologies Corporation. Process for controlling metal thickness, and deposition and degradation rates. 4,073,964, Cl. 427-10.000.

Herrmann, Rudolf, to Deutsche Texaco Aktiengesellschaft. Process for the continuous production of monochloroalkanes. 4,073,816, Cl. 260-648.00R.

Herth, Harro; Kraus, Bernd; Sautter, Wilfried; and Wessel, Wolf, to Robert Bosch GmbH. Fuel injection system. 4,073,269, Cl. 123-32.0EE.

Hess, Hans-Jurgen E.; and Schaaf, Thomas K., to Pfizer Inc. Cyanoprostaglandins. 4,074,044, Cl. 542-402.000.

Hesston Corporation: *See—*
Stoessel, Herman V.; and Prichard, Daniel R., 4,073,377, Cl. 198-624.000.

Hestermann, Klaus; Lippsmeier, Bernd; and Heymer, Gero, to Hoechst Aktiengesellschaft. Production of organophosphines. 4,073,810, Cl. 260-606.50P.

Hettinger, William P., Jr.: *See—*
Pfefferle, William C.; and Hettinger, William P., Jr., 4,073,716, Cl. 208-66.000.

Heymer, Gero: *See—*
Hestermann, Klaus; Lippsmeier, Bernd; and Heymer, Gero, 4,073,810, Cl. 260-606.50P.

Hickey, Lisa M., administratrix: *See—*
Hickey, Robert J., deceased; and Hickey, Lisa M., administratrix, 4,073,179, Cl. 72-409.000.

Hickey, Robert J., deceased; and by Hickey, Lisa M., administratrix, to Codman & Shurtleff, Inc. Clip removing device. 4,073,179, Cl. 72-409.000.

Hicks, Harry Clark, Jr., to Boeing Company, The. Apparatus and method for regeneration of chromosulfuric acid etchants. 4,073,708, Cl. 204-106.000.

Hijikata, Akiko: *See—*
Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Okamoto, Shosuke; and Hijikata, Akiko, 4,073,914, Cl. 424-267.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,891, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,892, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,913, Cl. 424-267.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,916, Cl. 424-267.000.

Hill, Carl J. Machine for process of poultry gizzards. 4,073,040, Cl. 17-43.000.

Hill, John Anthony: *See—*
Cilento, Rudolfo D.; and Hill, John Anthony, 4,073,861, Cl. 423-219.000.

Hill, Larry O.: *See—*
Brown, Glendon W.; Fine, Mary Jane; and Hill, Larry O., 4,073,748, Cl. 252-428.000.

Hills, Geoffrey Dean Loftus: *See—*
Scott, Trevor William; and Hills, Geoffrey Dean Loftus, 4,073,960, Cl. 426-580.000.

Hinchcliffe, Dennis; Daisley, Robert Thomas; Harper, Stanley Bernard; and Kilborn, Hilary Mark How'l, to Molins Limited. Apparatus for handling rod-like articles. 4,073,374, Cl. 198-425.000.

Hira, Kazumi, to Nissan Motor Company, Limited. Motor vehicle with a shelf in its luggage compartment. 4,073,534, Cl. 296-37.160.

Hiro, Etsuko: *See—*
Kondo, Kiyoshi; Tunemoto, Daiei; and Hiro, Etsuko, 4,073,799, Cl. 260-345.80P.

Hirsch, Martin: *See—*
Collin, Per Harald; Flink, Sune Natanael; Widell, Bjorn; Hirsch, Martin; and Reh, Lothar, 4,073,642, Cl. 75-35.000.

Hitachi, Ltd.: *See—*
Aiki, Kunio; Nakamura, Michiharu; and Umeda, Junichi, 4,073,676, Cl. 156-624.000.
Harada, Akikazu, 4,074,169, Cl. 315-39.750.
Ikeda, Takatoshi; and Ohuchi, Yoshio, 4,074,279, Cl. 346-75.000.
Kaji, Tadao; and Homma, Yoshio, 4,073,054, Cl. 29-580.000.
Kojima, Yasuyuki; Tanno, Kiyohiko; Doi, Tetsuo; and Ono, Kunio, 4,074,280, Cl. 346-76.00R.
Kusano, Masaaki; Okuhara, Shinzi; and Ohhinata, Ichiro, 4,074,299, Cl. 357-17.000.
Masuda, Kenzo, 4,074,238, Cl. 365-104.000.
Nomiya, Kosei; and Hotta, Shinkichi, 4,074,262, Cl. 340-365.00S.
Otomo, Koju; Itoh, Takeshi; Hayashi, Kazuyuki; Omoto, Hiroshi; Yui, Takayuki; and Suzuki, Makoto, 4,074,232, Cl. 340-147.00R.
Sato, Takashi, 4,074,148, Cl. 307-279.000.
Takagi, Nobuho; Takase, Mituo; Itoh, Takashi; Seno, Katsumi; and Koseki, Toshihiko, 4,073,594, Cl. 415-1.000.
Takasugi, Kazuo, 4,074,335, Cl. 361-87.000.
Takeuchi, Seiji; Fujita, Kazunori; and Shimokobe, Ikuo, 4,073,725, Cl. 210-31.00C.
Takeuchi, Yasuhisa; Maio, Kenji; and Matsumoto, Junichiro, 4,073,545, Cl. 303-109.000.
Yajima, Shunichi; Kakumoto, Shigeru; Fujimoto, Yoshiji; and Hananoi, Toshihiro, 4,074,231, Cl. 340-146.3AG.

Hitachi Shipbuilding & Engineering Co., Ltd.: *See—*
Minehisa, Setsuzi; Inui, Tatuo; and Fukuda, Hitoshi, 4,074,105, Cl. 219-137.800.

Hittmeier, Michael E.: *See—*
Clarke, John T.; Harker, Royce K.; Hittmeier, Michael E.; and Eaton, James W., 4,073,672, Cl. 156-219.000.

Hjalmarsson, Thomas: *See—*
Carlsson, Eric; Gefvert, Karl Ivan; Hjalmarsson, Thomas; Kerff, Anton; Pejchal, Karel; and Wide, Lars, 4,073,450, Cl. 242-131.000.

Hodogaya Chemical Co., Ltd.: *See—*
Ozutsumi, Minoru; Miyazawa, Yoshihide; and Yamaguchi, Masahiko, 4,073,614, Cl. 8-25.000.
Ozutsumi, Minoru; Miyazawa, Yoshihide; and Yamaguchi, Masahiko, 4,074,050, Cl. 544-92.000.

Hody, Dieter: *See—*
Willums, Jan-Olaf; and Hody, Dieter, 4,073,080, Cl. 37-195.000.

Hoechst Aktiengesellschaft: *See—*
Arneth, Reinhold; and Schwandt, Rudi, 4,073,266, Cl. 118-647.000.
Gebauer, Gerhard; Brandrup, Johannes; Kraft, Kurt; and Mayer, Franz, 4,074,007, Cl. 428-411.000.
Hestermann, Klaus; Lippsmeier, Bernd; and Heymer, Gero, 4,073,810, Cl. 260-606.50P.
Hunger, Klaus; and Papenfuhs, Theodor, 4,074,053, Cl. 548-305.000.
Idstein, Hermann; and Loew, Peter, 4,073,489, Cl. 271-277.000.
Optiz, Wolfgang; and Hennen, Hans, 4,073,871, Cl. 423-481.000.

Hofer, Gerald; and Konrath, Karl, to Robert Bosch GmbH. Fuel injection pump. 4,073,275, Cl. 123-139.0AF.

Hofer, Peter, to Titmus Eurocon Kontaktlinsen KG. Contact lenses of hydrophilic polymers made by photopolymerization. 4,073,577, Cl. 351-160.000.

Hoffman Electronics Corporation: *See—*
Olson, Roy H., 4,074,268, Cl. 343-106.00R.

Hoffman, Morris. Duplex cut film holder. 4,074,297, Cl. 354-285.000.

Hoffmann, Erich H. P.: *See—*
Glazar, James M.; and Hoffmann, Erich H. P., 4,073,681, Cl. 176-36.00R.

Hoffmann-La Roche Inc.: *See—*
Batcho, Andrew David; Hengartner, Urs Oskar; Leimgruber, Willy; Scott, John William; and Valentine, Donald, Jr., 4,073,795, Cl. 260-326.14T.
Kienzle, Frank; and Rosen, Perry, 4,074,045, Cl. 542-426.000.
Leimgruber, Willy; and Valentine, Donald Herman, Jr., 4,073,811, Cl. 260-611.00A.
Ramuz, Henri, 4,073,797, Cl. 260-327.00M.

Hofmeister, Helmut; Laurent, Henry; Wiechert, Rudolf; Annen, Klaus; and Steinbeck, Hermann, to Schering Aktiengesellschaft. 11 Beta-fluoropregnenes. 4,073,900, Cl. 424-243.000.

Hofrichter, Gernot: *See—*
Grill, Helmut; Zschocke, Rainer Hans; Wagner, Josef; Hofrichter, Gernot; and Janiak, P. Stefan, 4,073,935, Cl. 424-308.000.

Hohmann & Barnard, Inc.: *See—*
Hala, Alfred A., 4,073,329, Cl. 151-20.000.

Hokans, David H. Motorcycle sidecar mounting bracket. 4,073,503, Cl. 280-203.000.

Holloway, Brian Percy: *See—*
Aylmer, Norman Noel; Coe, Peter; Watson, John Graham; and Holloway, Brian Percy, 4,073,157, Cl. 61-111.000.

Holm, Robert E.; and Battershell, Robert D., to Diamond Shamrock Corporation. Cycloheximide-imide or carbamate combinations as fruit abscission agents. 4,073,637, Cl. 71-94.000.

Holmes Protection, Inc.: *See—*
Conklin, Robert M.; Everett, Charles J.; and Human, Arthur T., 4,074,246, Cl. 340-274.00R.

Holt, James L.: *See—*
Spence, Junior C.; Rorrer, Robert J.; and Holt, James L., 4,073,320, Cl. 139-383.00R.

Homeyer, Bernhard: *See—*
Fest, Christa; Hammann, Ingeborg; and Homeyer, Bernhard, 4,073,893, Cl. 424-200.000.

Homma, Yoshio: *See—*
Kaji, Tadao; and Homma, Yoshio, 4,073,054, Cl. 29-580.000.

Honeywell G.m.b.H.: *See—*
Rihm, Herbert; and Rogge, Walter, 4,073,473, Cl. 251-298.000.

Honeywell Inc.: *See—*
Quarton, William T., 4,074,281, Cl. 346-110.00R.
Szonntagh, Eugene L., 4,073,052, Cl. 29-570.000.
Szonntagh, Eugene L., 4,073,053, Cl. 29-570.000.

Honeywell Information Systems Inc.: *See—*
Woods, William E.; Stanley, Philip E.; Izbicki, Kenneth J.; and Ramsdell, Steven C., 4,074,353, Cl. 364-200.000.

Honn, James Joseph; and Stuby, Kenneth P., to International Business Machines Corporation. Electrical package for LSI devices and assembly process therefor. 4,074,342, Cl. 361-411.000.

Honna, Kosaku: *See—*
Ichikawa, Hiroshi; Sugimoto, Michio; Mizokami, Shigeyoshi; Honna, Kosaku; and Sugahara, Hirozo, 4,073,818, Cl. 260-668.00F.

Hoogovens Ijmuiden, BV: *See—*
van Cappelle, Hendrik Cornelis, 4,073,390, Cl. 214-14.000.

Hooker Chemicals & Plastics Corporation: *See—*
Bowman, Richard C.; and Kay, Daniel J., 4,073,761, Cl. 260-29.300.

Hopler, Robert Bartley, Jr., to Hercules Incorporated. Explosive energy-initiatable blasting caps containing a porous ignition and detonation system and method. 4,073,235, Cl. 102-22.000.

Horii, Shoichi: *See—*
Yamada, Shoji; Tanaka, Akira; Horii, Shoichi; and Yamashita, Kiyoshi, 4,073,651, Cl. 96-100.00R.

Horioka, Masayoshi: *See—*
Akito, Eiichiro; Nakajima, Yoshiyuki; and Horioka, Masayoshi, 4,073,931, Cl. 424-298.000.

Horiuchi, Teruo: *See—*
Imai, Makoto; Horiuchi, Teruo; and Kashiwa, Ichiro, 4,073,881, Cl. 424-70.000.

Horizons Incorporated: *See—*
Wainer, Eugene, 4,073,989, Cl. 428-131.000.

Horninger, Karlheinrich, to Siemens Aktiengesellschaft. Linear output amplifier for charge-coupled devices. 4,074,206, Cl. 330-269.000.

Hortel, Willy. Method for production of multilayer composite plate. 4,073,674, Cl. 156-285.000.

Hoshi, Tetsutaro: *See—*
Shaw, Milton C.; and Hoshi, Tetsutaro, 4,073,214, Cl. 90-24.00D.

Hosoda, Minoru; Kasiwagi, Eiichi; Murayama, Fumio; and Isayama, Kohei. Aqueous epoxy resin paint composition. 4,073,762, Cl. 260-29.300.

Hota, Kazunori: *See—*
Asaeda, Toshio; Suzuki, Ikuo; Imai, Tomoyasu; Kitajima, Masato; and Hota, Kazunori, 4,073,281, Cl. 125-11.0CD.

Hotta, Shinkichi: *See—*
Nomiya, Kosei; and Hotta, Shinkichi, 4,074,262, Cl. 340-365.00S.

Hough Manufacturing Corporation: *See—*
Williams, Charles E., 4,073,092, Cl. 49-127.000.

Hovemann, Friedrich: *See—*
Ladenberger, Volker; Bronstert, Klaus; Hovemann, Friedrich; and Simak, Petr, 4,073,738, Cl. 252-56.00R.

Howden, Harry: *See—*
Clarke, John Alfred; and Howden, Harry, 4,073,574, Cl. 350-189.000.

HPM Corporation: *See—*
Kruder, George A.; and Gudermuth, Clyde S., Jr., 4,074,362, Cl. 366-82.000.

Huber, Peter: *See—*
Benda, Hansjochen; and Huber, Peter, 4,074,303, Cl. 357-33.000.

Huebner, Charles Ferdinand, to Ciba-Geigy Corporation. Indolylalkylpiperidines. 4,073,911, Cl. 424-267.000.

Huggins, David A.; and Nissen, Norman C., to International Nickel Company, Inc., The. Precipitation of filterable nickel and/or cobalt sulfides from acid solutions. 4,073,860, Cl. 423-140.000.

Huggins Engineering Company: *See—*
Pecchenino, Paul L., 4,073,401, Cl. 220-88.00R.

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Christy, Ronald I., 4,073,552, Cl. 308-201.000.
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Conklin, Robert M.; Everett, Charles J.; and Human, Arthur T., 4,074,246, Cl. 340-274.00R.

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Edixhoven, Gerardus Hendrikus, 4,073,044, Cl. 29-24.500.
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Hurco Manufacturing Company Inc.: *See—*
Roch, Gerald V.; and Wiles, James P., 4,074,350, Cl. 364-107.000.
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Chandler, Keith L.; Hyldon, Roy G.; Kumar, Surinder; and O'Mahony, John P., 4,073,948, Cl. 426-44.000.
Ianetti, Anthony V.: *See—*
Maute, Charles J.; and Ianetti, Anthony V., 4,074,124, Cl. 362-217.000.
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Taylor, Henry James; and Ibbotson, Philip Nicholas Peter, 4,073,201, Cl. 74-665.00L.
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Ferrarini, James; and Kuehn, Erich, 4,073,828, Cl. 260-859.00R.
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Ieda, Michael E., 4,073,087, Cl. 46-202.000.
Idemitsu Kosan Co., Ltd.: *See—*
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Kuschel, Konrad, 4,074,154, Cl. 310-29.000.
Iglesias, Edmundo J.: *See—*
Lerner, Julius; and Iglesias, Edmundo J., 4,073,304, Cl. 137-101.210.
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Ikeda, Yusuke: *See—*
Yasuda, Koichi; Ikeda, Yusuke; and Nishida, Yukiaki, 4,073,883, Cl. 424-94.000.
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Kawamatsu, Yutaka; Saraie, Takahiro; Imamiya, Eiko; and Hamuro, Yukihiko, 4,074,057, Cl. 560-55.000.
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Darragh, John Irvine; and Inglis, Hugh Stewart, 4,073,787, Cl. 260-290.00P.
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Lawes, Norman Edward, 4,073,429, Cl. 229-62.500.
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Pate, Harold T., 4,073,514, Cl. 285-127.000.
Indianapolis Center for Advanced Research: *See—*
Eggleton, Reginald C.; and Williamson, Warren L., 4,074,223, Cl. 340-1.00R.
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Mikule, Jiri; and Hecken, Wilfried, 4,073,310, Cl. 137-389.000.
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Webb, Paul Dale; and Morse, Henry William, 4,073,607, Cl. 418-86.000.
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Fraser, Arthur D.; and Inglis, Dwight A., 4,073,309, Cl. 137-344.000.
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Darragh, John Irvine; and Inglis, Hugh Stewart, 4,073,787, Cl. 260-290.00P.
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Inoue, Akira: *See—*
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Wada, Motomu; Inoue, Masakazu; Furukawa, Kazunori; and Matsubara, Shigeyoshi, 4,073,844, Cl. 264-55.000.
Inoue, Takaya: *See—*
Noda, Yasuo; and Inoue, Takaya, 4,073,677, Cl. 159-6.00W.
Institut Francais du Petrole: *See—*
Laurent, Jean, 4,074,224, Cl. 340-8.0PC.
Instrumentation Specialties Company: *See—*
Allington, Robert William, 4,073,182, Cl. 73-1.00R.
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Honn, James Joseph; and Stuby, Kenneth P., 4,074,342, Cl. 361-411.000.
Johnson, Duane Edward; and Pederson, Lester Arlyn, 4,074,031, Cl. 526-49.000.
Lane, Ramon; and Taub, Howard Hyman, 4,074,277, Cl. 346-75.000.
Melcher, Robert Lee; and Shiren, Norman Steven, 4,074,240, Cl. 365-192.000.
Norton, David Gibbons; and Wright, Gary Thorup, 4,074,330, Cl. 360-102.000.
Roalson, Howard John, 4,074,134, Cl. 250-324.000.
Spampinato, Dominic Patrick, 4,074,237, Cl. 365-230.000.
Trippel, Gerhard, 4,074,016, Cl. 428-626.000.
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Thomas, Roy, 4,074,235, Cl. 364-900.000.
International Flavors & Fragrances Inc.: *See—*
Hall, John B.; Sprecker, Mark A.; Schmitt, Frederick Louis; and Vock, Manfred Hugo, 4,073,751, Cl. 252-522.000.
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Huggins, David A.; and Nissen, Norman C., 4,073,860, Cl. 423-140.000.
Volin, Timothy Earl; Benjamin, John Stanwood; Larson, Jay Michael; and Cairns, Robert Lacock, 4,073,648, Cl. 75-245.000.
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Anhalt, John W.; Goodman, David S.; and Peterson, Carl W., 4,073,560, Cl. 339-99.00R.
Portnoy, Norman A.; and Anderson, David Paul, 4,073,660, Cl. 106-311.000.

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Minehisa, Setsuzi; Inui, Tatuo; and Fukuda, Hitoshi, 4,074,105, Cl. 219-137.800.
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Kodric, Joseph, 4,073,469, Cl. 251-86.000.
Ionit Anstalt Bernhard Berghaus: *See—*
Edenhofer, Bernd, 4,074,140, Cl. 250-492.00R.
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Groth, Roger L.; Harvey, Randall L.; Lauer, Thomas R.; and Ronnebaum, Morris L., 4,073,346, Cl. 172-439.000.
Irish, Elwood, to Unistrut Corporation. Insert assembly for use in pre-stressed concrete structures. 4,073,114, Cl. 52-710.000.
Isayama, Kohei: *See—*
Hosoda, Minoru; Kasiwagi, Eiichi; Murayama, Fumio; and Isayama, Kohei, 4,073,762, Cl. 260-29.300.
Ishida, Akira, to Nippon Telegraph and Telephone Public Corporation. Memory device. 4,074,236, Cl. 365-200.000.
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Murakami, Kanemichi; Ishida, Yoshihiro; and Okubo, Kazuo, 4,074,333, Cl. 361-13.000.
Ishikawa, Eiichiro: *See—*
Fujino, Masahiko; Wakimasu, Mitsuhiro; Taketomi, Shigehisa; and Ishikawa, Eiichiro, 4,073,890, Cl. 424-177.000.
Ishikawa, Manabu: *See—*
Soga, Mitsuo; Takase, Yuuzo; Ishikawa, Manabu; Nakazawa, Masahiko; and Nakayama, Mutumi, 4,074,034, Cl. 526-56.000.
Ismailov, Amina Kyazim Kyzy, administrator: *See—*
Aliev, Vagab Safarovich; Markarian, Georgy Georgievich; Rustamov, Musa Ismail ogly; Pryanikov, Evgeny Ivanovich; Ismailova, Rustam Gadzhi Ali ogly, deceased; Ismailov, Amina Kyazim Kyzy, administrator; Ismailova, Ali Rustam ogly, administrator; Ismailova, Dzhulietta Rustamovna, administrator; and Kulieva, Zhanna Rustamovna, administrator, 4,073,717, Cl. 208-74.000.
Ismailova, Ali Rustam ogly, administrator: *See—*
Aliev, Vagab Safarovich; Markarian, Georgy Georgievich; Rustamov, Musa Ismail ogly; Pryanikov, Evgeny Ivanovich; Ismailova, Rustam Gadzhi Ali ogly, deceased; Ismailov, Amina Kyazim Kyzy, administrator; Ismailova, Ali Rustam ogly, administrator; Ismailova, Dzhulietta Rustamovna, administrator; and Kulieva, Zhanna Rustamovna, administrator, 4,073,717, Cl. 208-74.000.
Ismailova, Dzhulietta Rustamovna, administrator: *See—*
Aliev, Vagab Safarovich; Markarian, Georgy Georgievich; Rustamov, Musa Ismail ogly; Pryanikov, Evgeny Ivanovich; Ismailova, Rustam Gadzhi Ali ogly, deceased; Ismailov, Amina Kyazim Kyzy, administrator; Ismailova, Ali Rustam ogly, administrator; Ismailova, Dzhulietta Rustamovna, administrator; and Kulieva, Zhanna Rustamovna, administrator, 4,073,717, Cl. 208-74.000.
Ismailova, Rustam Gadzhi Ali ogly, deceased: *See—*
Aliev, Vagab Safarovich; Markarian, Georgy Georgievich; Rustamov, Musa Ismail ogly; Pryanikov, Evgeny Ivanovich; Ismailova, Rustam Gadzhi Ali ogly, deceased; Ismailov, Amina Kyazim Kyzy, administrator; Ismailova, Ali Rustam ogly, administrator; Ismailova, Dzhulietta Rustamovna, administrator; and Kulieva, Zhanna Rustamovna, administrator, 4,073,717, Cl. 208-74.000.
Isobe, Yasuo: *See—*
Nakamoto, Soichi; Ito, Tadashi; Ito, Fumio; and Isobe, Yasuo, 4,074,292, Cl. 354-53.000.
Israel Chemicals Ltd.: *See—*
Feilchenfeld, Max Hans, 4,073,875, Cl. 423-504.000.
Istituto Biochimico Italiano di Loredana Lorenzini S.a.s.: *See—*
Valcavi, Umberto, 4,073,938, Cl. 424-317.000.
Italo Danioni S.d.f.: *See—*
Danioni, Francesco, 4,073,443, Cl. 241-65.000.
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Nakamoto, Soichi; Ito, Tadashi; Ito, Fumio; and Isobe, Yasuo, 4,074,292, Cl. 354-53.000.
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Nakamoto, Soichi; Ito, Tadashi; Ito, Fumio; and Isobe, Yasuo, 4,074,292, Cl. 354-53.000.
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Takagi, Nobuho; Takase, Mituo; Itoh, Takashi; Seno, Katsumi; and Koseki, Toshihiko, 4,073,594, Cl. 415-1.000.
Itoh, Takeshi: *See—*
Otomo, Koju; Itoh, Takeshi; Hayashi, Kazuyuki; Omoto, Hiroshi; Yui, Takayuki; and Suzuki, Makoto, 4,074,232, Cl. 340-147.00R.
Itokawa, Natsuo: *See—*
Yasujima, Nobuo; Arai, Juichiro; Itokawa, Natsuo; and Okino, Katsumoto, 4,073,971, Cl. 427-103.000.
ITT Industries, Incorporated: *See—*
Heinecke, Rudolf August Herbert; and Ashcroft, Geoffrey Laurence, 4,073,669, Cl. 156-643.000.
Ivanov, Boris Gavrilovich: *See—*
Rundkvist, Konstantin Alexandrovich; Ivanov, Nikolai Alexeevich; Ivanov, Boris Gavrilovich; Zarogatsky, Leonid Petrovich; Mitrofanov, Evgeny Sergeevich; and Blekhman, Ilya Izrailevich, 4,073,446, Cl. 241-207.000.
Ivanov, Nikolai Alexeevich: *See—*
Rundkvist, Konstantin Alexandrovich; Ivanov, Nikolai Alexeevich; Ivanov, Boris Gavrilovich; Zarogatsky, Leonid Petrovich; Mitrofanov, Evgeny Sergeevich; and Blekhman, Ilya Izrailevich, 4,073,446, Cl. 241-207.000.
Ivey, John Saxon: *See—*
Abendschein, Frederic Henry; Ivey, John Saxon; Roberts, Richard W.; and Tothero, Dwight L., 4,073,603, Cl. 417-222.000.
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Iwatsu Electric Co., Ltd.: *See—*
Kakito, Akira; Yasui, Junichi; and Koganei, Yoji, 4,073,028, Cl. 15-102.000.
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Woods, William E.; Stanley, Philip E.; Izbicki, Kenneth J.; and Ramsdell, Steven C., 4,074,353, Cl. 364-200.000.
J. M. Voith GmbH: *See—*
Schiel, Christian, 4,073,679, Cl. 162-306.000.
J.P. Stevens & Co., Inc.: *See—*
Spence, Junior C.; Rorrer, Robert J.; and Holt, James L., 4,073,320, Cl. 139-383.00R.
Jablkiewicz, Jerzy: *See—*
Ostrowski, Jerzy; Sierputowski, Piotr; Turkowski, Lukasz; Jablkiewicz, Jerzy; Pacholski, Jan; and Jedryka, Tadeusz, 4,073,128, Cl. 57-58.890.
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Jackson, Douglas: *See—*
Cunningham, Sinclair Upton; and Jackson, Douglas, 4,073,247, Cl. 112-121.120.
Jackson, John Lambert: *See—*
Archibald, John Leheup; and Jackson, John Lambert, 4,073,790, Cl. 260-293.730.
Jaclyn, Inc.: *See—*
Chestnov, Robert E., 4,073,853, Cl. 264-132.000.
Jacobs, Eli S.: *See—*
Russell, James T., 4,074,085, Cl. 179-100.30B.
Jacobs Manufacturing Company, Limited, The: *See—*
Derbyshire, George Cecil, 4,073,498, Cl. 279-62.000.
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Cabasso, Israel; Jagur-Grodzinski, Joseph; and Vofsi, David, 4,073,754, Cl. 260-17.00R.
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Grill, Helmut; Zschocke, Rainer Hans; Wagner, Josef; Hofrichter, Gernot; and Janiak, P. Stefan, 4,073,935, Cl. 424-308.000.
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Janome Sewing Machine Co., Ltd.: *See—*
Eguchi, Yasukata, 4,073,253, Cl. 112-275.000.
Kasuga, Noboru, 4,073,250, Cl. 112-274.000.
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Janssen, Johannes Hendrikus Hubertus, to U.S. Philips Corporation. Electric machine. 4,074,173, Cl. 318-138.000.
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Jedryka, Tadeusz: *See—*
Ostrowski, Jerzy; Sierputowski, Piotr; Turkowski, Lukasz; Jablkiewicz, Jerzy; Pacholski, Jan; and Jedryka, Tadeusz, 4,073,128, Cl. 57-58.890.
Ostrowski, Jerzy; Sierputowski, Piotr; Turkowski, Lukasz; Jablkiewicz, Jerzy; Pacholski, Jan; and Jedryka, Tadeusz, 4,073,129, Cl. 57-58.890.
Jenstrom, Einar R.: *See—*
Keifert, Hibbard G.; and Jenstrom, Einar R., 4,073,427, Cl. 228-165.000.
Jentoft, Arthur P.; and Couture, Paul A., to Wasco Products, Inc. Energy efficient skylight construction. 4,073,097, Cl. 52-22.000.
Jersey Nuclear-Avco Isotopes, Inc.: *See—*
Avicola, Kenneth, 4,073,572, Cl. 350-174.000.
Mack, Michael E.; and Northam, Donna B. C., 4,074,208, Cl. 331-94.50P.
John O. Butler Company: *See—*
Tarrson, Emanuel B.; Tisma, Steven; and Ritch, Donald, 4,073,419, Cl. 225-44.000.
John Thomas Batts, Inc.: *See—*
Batts, John H.; and Duester, Everett L., 4,073,457, Cl. 248-340.000.
John Wyeth & Brother Limited: *See—*
Archibald, John Leheup; and Jackson, John Lambert, 4,073,790, Cl. 260-293.730.
White, Alan Chapman; and Black, Robin Michael, 4,073,906, Cl. 424-251.000.
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Johnson, James R.: *See—*
Close, James R.; and Johnson, James R., 4,073,318, Cl. 138-149.000.
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Lauer, William; and Mouwen, Herman Charles, 4,073,732, Cl. 210-491.000.
Marvel, John R.; and Mezick, James A., 4,073,291, Cl. 128-155.000.
Mesek, Frederick K., 4,073,852, Cl. 264-122.000.
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Johnston, John O.: *See—*
Grunwell, Joyce F.; and Johnston, John O., 4,073,899, Cl. 424-238.000.
Johnston Laboratories, Inc.: *See—*
Ahnell, Joseph E.; Broman, Rodney L.; and Waters, John R., 4,073,691, Cl. 195-103.50M.
Buda, Dennis; Broman, Rodney L.; and Waters, John R., 4,073,694, Cl. 195-103.700.
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Richards, David O.; Jones, Isaac P.; Duffee, Homer W.; and Nutter, Charles E., 4,073,997, Cl. 428-285.000.
Jones & Laughlin Steel Corporation: *See—*
Gerding, Charles Christian, 4,073,334, Cl. 164-87.000.
Jones, Thomas E. Cleaning apparatus for sewer pipes and the like. 4,073,302, Cl. 134-167.00C.
Jonscher, Charles Maria, to Post Office. Error correction of digital signals. 4,074,228, Cl. 340-146.1AQ.
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Jordan, Wesley A.: *See—*
Jones, Duane A.; and Jordan, Wesley A., 4,074,043, Cl. 536-52.000.
Jorgensen, Allen C., to Raymond Lee Organization, Inc., The, a part interest. Collapsible guitar. 4,073,211, Cl. 84-291.000.
Joris, Albert P. Mailbox signal. 4,073,430, Cl. 232-35.000.
Josef Martin Feuerungsbau GmbH: *See—*
Martin, Johannes Josef; and Weber, Erich, 4,073,480, Cl. 266-201.000.
Jossel, Franklin: *See—*
Mammino, Joseph; and Jossel, Franklin, 4,073,965, Cl. 427-22.000.
Judin, Vladimir Konstantinovich: *See—*
Minichev, Vasily Mikhailovich; Simis, Evgeny Moiseevich; and Judin, Vladimir Konstantinovich, 4,074,161, Cl. 310-194.000.
Jukes, John Alan: *See—*
Walling, Jorg-Hein; and Jukes, John Alan, 4,073,265, Cl. 118-634.000.
Jules, Jacques M. Frequency measuring device for telecommunication systems. 4,074,191, Cl. 324-79.00R.
Jurek, Dennis J.: *See—*
Widstrand, John C.; and Jurek, Dennis J., 4,074,156, Cl. 310-62.000.
Jutte, Hans: *See—*
Stuckmann, Dieter; and Jutte, Hans, 4,073,153, Cl. 61-85.000.
Kabushiki Kaisha Daini Seikosha: *See—*
Ikehata, Yukio; Ikenishi, Masataka; Kushida, Shozo; and Kikuchi, Tadahiro, 4,074,093, Cl. 200-52.00R.
Kabushiki Kaisha Komatsu Seisakusho: *See—*
Kishitani, Masatoshi; Tamagaki, Yoshiteru; Matsumoto, Takeji; Sugimoto, Mikio; and Namiki, Noriaki, 4,073,152, Cl. 61-63.000.
Takada, Shinichi, 4,073,168, Cl. 70-165.000.
Kabushiki Kaisha Sato Kenkyusho: *See—*
Sato, Yo, 4,073,234, Cl. 101-288.000.
Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See—*
Takeda, Nobuhiro; Hattori, Masaichi; Kondo, Minoru; and Kato, Tatsuo, 4,074,226, Cl. 340-52.00B.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Asai, Kiyokazu; and Takeuchi, Akihiro, 4,074,152, Cl. 310-334.000.
Kaduki, Charles L.; and Stoneking, Richard D., to Essex Group, Inc. Control system for gas burning apparatus. 4,073,611, Cl. 431-45.000.
Kaieda, Nobuo: *See—*
Fujita, Hisaya; Kaieda, Nobuo; Sato, Setsuo; and Kawakami, Kenji, 4,074,274, Cl. 346-34.000.
Kaiser, Carl; and Lafferty, John Joseph, to SmithKline Corporation. Piperidylidene derivatives of benzo-fused xanthenes, thioxanthenes and dibenzoxepins and antipsychotic use thereof. 4,073,912, Cl. 424-267.000.
Kaiser, James Frederick: *See—*
Hamming, Richard Wesley; and Kaiser, James Frederick, 4,074,212, Cl. 333-70.00T.
Kaji, Tadao; and Homma, Yoshio, to Hitachi, Ltd. Method of fabricating semiconductor device. 4,073,054, Cl. 29-580.000.
Kakinuma, Yoshikazu; and Morokuma, Tadashi, to Olympus Optical Co., Ltd. Endoscope utilizing color television and fiber optics techniques. 4,074,306, Cl. 358-1.000.
Kakito, Akira; Yasui, Junichi; and Koganei, Yoji, to Iwatsu Electric Co., Ltd. Etching processing apparatus. 4,073,028, Cl. 15-102.000.
Kakumoto, Shigeru: *See—*
Yajima, Shunichi; Kakumoto, Shigeru; Fujimoto, Yoshiji; and Hananoi, Toshihiro, 4,074,231, Cl. 340-146.3AG.
Kalmus, Henry P. Tire pressure indicator. 4,074,227, Cl. 340-58.000.
Kalnin, Ilmar L., to Celanese Corporation. Internal chemical modification of carbon fibers to yield a product of reduced electrical conductivity. 4,073,869, Cl. 423-447.100.
Kaloi, Cyril M., to United States of America, Navy. Multiple frequency microstrip antenna assembly. 4,074,270, Cl. 343-700.0MS.
Kamerling, Marc A.; Franks, Jeffrey L.; and Wilson, Harold R., to Donnelly Mirrors, Inc. Mirror assembly method. 4,073,855, Cl. 264-249.000.
Kamyr Inc.: *See—*
Funk, Erwin D., 4,073,629, Cl. 48-77.000.
Kanbier, Dirk; and Goudriaan, Frans, to Shell Oil Company. Catalyst regeneration by circulating catalyst in a hydrotreating oil process. 4,073,721, Cl. 208-251.00H.
Kandul, Jury Vasilievich; Semeny, Valery Yakovlevich; Pivovarov, Mikhail Danilovich; Malovik, Vladlen Vasilievich; Mazepa, Ivan Karpovich; and Feschenko, Ninel Gavrilovna. Method for producing trialkylphosphine oxides. 4,073,809, Cl. 260-606.50P.
Kanebo, Ltd.: *See—*
Nishida, Takeshi; Morioka, Masao; Ohta, Tetsuro; and Yamakawa, Yukio, 4,073,988, Cl. 428-91.000.
Kansai Kagaku Kikai Seisaku Kabushiki Kaisha: *See—*
Noda, Yasuo; and Inoue, Takaya, 4,073,677, Cl. 159-6.00W.
Kansai Paint Company, Limited: *See—*
Nakayama, Yasuharu; Watanabe, Tadashi; Yamashita, Yoshio; Aihara, Tetsuo; and Toyomoto, Isao, 4,073,758, Cl. 260-23.0EP.
Kanten, Thomas M.: *See—*
Heikkinen, Duane G.; and Kanten, Thomas M., 4,074,012, Cl. 428-425.000.
Kantorowicz, Gerard: *See—*
Epsztein, Bernard; and Kantorowicz, Gerard, 4,074,213, Cl. 333-71.000.
Kao Soap Co., Ltd.: *See—*
Handa, Susumu; Tanaka, Yoshiaki; Nishihata, Atsushi; Ueda, Sadashi; Inamoto, Yoshiaki; Tanimoto, Fumio; and Kitano, Hisao, 4,074,052, Cl. 544-221.000.
Ohtani, Naoteru; Koyama, Tutomu; Takeuchi, Takashi; Azuma, Toshihiro; and Matsuda, Morio, 4,073,658, Cl. 106-92.000.
Kapes, William John, Jr., to Bell Telephone Laboratories, Incorporated. LED array imaging system-serial approach. 4,074,318, Cl. 358-230.000.
Kapes, William John, Jr., to Bell Telephone Laboratories, Incorporated. High quality light emitting diode array imaging system. 4,074,320, Cl. 358-230.000.
Kapes, William John, Jr.: *See—*
Goldschmidt, Wilbur Harry; Henning, Hansjuergen Hermann; and Kapes, William John, Jr., 4,074,319, Cl. 358-230.000.
Karapita, Alex D.: *See—*
Karapita, Alexander Donald; and Orr, James Douglas, 4,073,456, Cl. 248-337.000.
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Karler, Arthur, to Diagnostic Data, Inc. Treatment of arthritis and allied conditions with xenylsalate. 4,073,897, Cl. 424-230.000.
Karlskind, Neil, to Gray Tool Company. Wet connector. 4,073,562, Cl. 339-117.00P.
Karter, Elias M.: *See—*
Hammond, Jack A.; and Karter, Elias M., 4,073,678, Cl. 162-19.000.
Kartiala, Tauno F. Sauna heater. 4,073,286, Cl. 126-344.000.
Kashiwa, Ichiro: *See—*
Imai, Makoto; Horiuchi, Teruo; and Kashiwa, Ichiro, 4,073,881, Cl. 424-70.000.
Kasiwagi, Eiichi: *See—*
Hosoda, Minoru; Kasiwagi, Eiichi; Murayama, Fumio; and Isayama, Kohei, 4,073,762, Cl. 260-29.300.
Kaspers, Helmut: *See—*
Buchel, Karl Heinz; Frohberger, Paul-Ernst; and Kaspers, Helmut, 4,073,901, Cl. 424-245.000.
Kasuga, Noboru, to Janome Sewing Machine Co., Ltd. Intermittent drive for sewing machine. 4,073,250, Cl. 112-274.000.
Katchman, Arthur; and Lee, Gim Fun, Jr., to General Electric Company. Filled polyphenylene ether compositions having improved toughness. 4,073,765, Cl. 260-40.00R.
Kathawala, Faizulla G.: *See—*
Galantay, Eugene E.; and Kathawala, Faizulla G., 4,073,936, Cl. 424-308.000.
Kato, Tatsuo: *See—*
Takeda, Nobuhiro; Hattori, Masaichi; Kondo, Minoru; and Kato, Tatsuo, 4,074,226, Cl. 340-52.00B.
Kato, Tokuji: *See—*
Kogo, Hiroshi; Kato, Tokuji; and Uematsu, Takashi, 4,074,317, Cl. 358-181.000.
Katsube, Junki: *See—*
Shimomura, Hiromi; Sugie, Akihiko; Katsube, Junki; and Yamamoto, Hisao, 4,073,933, Cl. 424-299.000.
Katsui, Saburo: *See—*
Washizuka, Isamu; Hashimoto, Shintaro; and Katsui, Saburo, 4,074,118, Cl. 364-712.000.
Kauter, Hans, to Gewerkschaft Eisenhutte Westfalia. Mine roof support assemblies. 4,073,149, Cl. 61-45.00D.
Kawai, Mitsuji. Switch device. 4,074,144, Cl. 307-10.00R.

Kawai, Syuji: *See*—
Yamauchi, Kazuhisa; Takakura, Koichi; Kawai, Syuji; and Ohmori, Akio, 4,073,733, Cl. 210-500.00M.

Kawakami, Kenji: *See*—
Fujita, Hisaya; Kaieda, Nobuo; Sato, Setsuo; and Kawakami, Kenji, 4,074,274, Cl. 346-34.000.

Kawamatsu, Yutaka; Saraie, Takahiro; Imamiya, Eiko; and Hamuro, Yukihiko, to Takeda Chemical Co., Ltd. 2-Halopropionic acid and its derivatives. 4,074,057, Cl. 560-55.000.

Kawami, Youji: *See*—
Torikai, Eiichi; and Kawami, Youji, 4,073,705, Cl. 204-92.000.

Kawamura, Hiroshi; Nishitani, Yoshihisa; and Muta, Katsumi, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for reproducing multiplex video data. 4,074,315, Cl. 358-142.000.

Kawasaki, Hironobu: *See*—
Teramae, Akira; Yamada, Koji; and Kawasaki, Hironobu, 4,074,011, Cl. 428-422.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Yamazaki, Yorio, 4,073,505, Cl. 280-301.000.

Kawasaki Motors Corporation, U.S.A.: *See*—
Fox, Wayne S., 4,073,279, Cl. 123-198.0DC.

Kawashima, Hidetoshi; Ohtake, Shinzaburo; Fujimori, Toru; Ohkawa, Isao; and Tajima, Tetsuya, to Eisai Co., Ltd. Method for treatment of diabetes. 4,073,910, Cl. 424-266.000.

Kawatsu, Toshitatsu, to Sankyo Kogaku Kogyo Kabushiki Kaisha. Fade photographing control apparatus for cine camera. 4,073,580, Cl. 352-91.00C.

Kay, Daniel J.: *See*—
Bowman, Richard C.; and Kay, Daniel J., 4,073,761, Cl. 260-29.300.

Keahl, Gerald T.: *See*—
Way, Allan S.; Glenn, Thomas J.; Sloane, Howard J.; and Keahl, Gerald T., 4,074,272, Cl. 346-33.00A.

Keck, Johannes; Puschmann, Sigfrid; Kruger, Gerd; Noll, Klaus-Reinhold; Leitold, Matyas; and Pieper, Helmut, to Boehringer Ingelheim GmbH. Halo-substituted hydroxybenzyl-amines as secretolytic agents. 4,073,942, Cl. 424-330.000.

Kee, Richard C., to Polaroid Corporation. Compact accessory strobe for cameras with battery enclosed film pack. 4,074,295, Cl. 354-145.000.

Kehm, Walter C., to Baxter Travenol Laboratories, Inc. Blood fractionation process using block copolymers of ethylene oxide and polyoxypropylene. 4,073,886, Cl. 260-112.00B.

Keifert, Hibbard G.; and Jenstrom, Einar R., to Fansteel Inc. Lined equipment with triclad wall construction. 4,073,427, Cl. 228-165.000.

Keller, Harold E.: *See*—
Fishbaugh, Byron L.; Keller, Harold E.; and Stewart, Lionel G., 4,073,047, Cl. 29-450.000.

Keller, Herman F., to Nikkel, Leon; Nikkel, Kermit; and Brown, Lelus B., part interest to each. Hand safety flasher. 4,074,252, Cl. 340-321.000.

Kelley Co., Inc.: *See*—
Runft, Arthur J., 4,074,112, Cl. 200-279.000.

Kelley, George G., to United States of America, Energy. Toroidal band limiter for a plasma containment device. 4,073,680, Cl. 176-3.000.

Kelly, Robert George: *See*—
Lawson, Frank; Ward, Denby Harcourt; and Kelly, Robert George, 4,073,481, Cl. 266-215.000.

Kemira Oy: *See*—
Suppanen, Pekka Ilkka Juhani, 4,073,635, Cl. 71-34.000.

Kennedy, Samuel F. Floor deck structure. 4,073,110, Cl. 52-303.000.

Kenney, George Churchill, II: *See*—
Balas, Charles, Jr.; Lou, David Yuan Kong; and Kenney, George Churchill, II, 4,074,282, Cl. 346-135.000.

Kenway Incorporated: *See*—
Allred, James Kenneth; Liddell, Arlyn G.; Quinn, Edward Barney; and Black, Francis Bischoff, 4,074,120, Cl. 235-419.000.

Keough, Laurence J.; and Butts, Bruce D., to Texas Instruments Incorporated. Keyboard apparatus and method of making. 4,074,088, Cl. 200-5.00A.

Kerff, Anton: *See*—
Carlsson, Eric; Gefvert, Karl Ivan; Hjalmarsson, Thomas; Kerff, Anton; Pejchal, Karel; and Wide, Lars, 4,073,450, Cl. 242-131.000.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Heinzelmann, Max; Rohloff, Fritz; and Schuren, Hans, 4,074,136, Cl. 250-392.000.

Keslar, Leroy D.; and Vensel, James E., to PPG Industries, Inc. Laminated glazing unit with composite interlayer. 4,073,986, Cl. 428-38.000.

Kienzle, Frank; and Rosen, Perry, to Hoffmann-La Roche Inc. 2H-cyclopenta[b]furan-2-ones and process for preparation. 4,074,045, Cl. 542-426.000.

Kikuchi, Tadahiro: *See*—
Ikehata, Yukio; Ikenishi, Masataka; Kushida, Shozo; and Kikuchi, Tadahiro, 4,074,093, Cl. 200-52.00R.

Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Okamoto, Shosuke; and Hijikata, Akiko, to Mitsubishi Chemical Industries Limited; and Okamoto, Shosuke. N^2-naphthalenesulfonyl-L-argininamides and the pharmaceutically acceptable salts thereof. 4,073,914, Cl. 424-267.000.

Kikumoto, Ryoji: *See*—
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,891, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,892, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,913, Cl. 424-267.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,916, Cl. 424-267.000.

Kilborn, Hilary Mark How'l: *See*—
Hinchcliffe, Dennis; Daisley, Robert Thomas; Harper, Stanley Bernard; and Kilborn, Hilary Mark How'l, 4,073,374, Cl. 198-425.000.

Kimball International, Inc.: *See*—
Whittington, Billy J.; Welsh, Alan B.; and Burns, Timothy L., 4,073,209, Cl. 84-1.240.

Kimura, Minoru; Tango, Hiroyuki; and Ohmori, Yukio, to Agency of Industrial Science and Technology, The President of the. Method for manufacturing semiconductor devices. 4,073,055, Cl. 29-583.000.

King, James D., to Henny Penny Corporation. Countertop display warmer. 4,074,108, Cl. 219-214.000.

Kinosz, Donald L.; and Haupin, Warren E., to Aluminum Company of America. Electrolytic production of magnesium. 4,073,703, Cl. 204-70.000.

Kinsey, Lewis R. Battery for electric powered vehicles. 4,074,017, Cl. 429-1.000.

Kinson, Philip L.; and Quinn, Clayton B., to General Electric Company. Dehydrochlorination method. 4,073,814, Cl. 260-619.00A.

Kiritani, Yoshio; Tsuyuguchi, Michio; Ibaragi, Tetsuo; Yano, Katsuhiro; Sunami, Yoshihiko; Nishioka, Kunihiko; and Sumikin Coke Company Limited, to Sumitomo Metal Industries Limited. Process for preparing briquettes. 4,073,625, Cl. 44-10.00R.

Kirko, Elena Viktorovna: *See*—
Byalko, Mikhail Vladimirovich; Kirko, Elena Viktorovna; Perlovsky, Rafael Shliomovich; and Ryzhnev, Vadim Jurievich, 4,073,183, Cl. 73-23.000.

Kirkpatrick, Alan D., to Robud Co. Lock for rotary die cutting blanket. 4,073,207, Cl. 83-659.000.

Kirkpatrick, Alan D., to Robud Co. Anvil structure for rotary die cutting apparatus. 4,073,208, Cl. 83-659.000.

Kishi, Hidehiro; Harakawa, Hiroshi; Ogawa, Kazuo; and Tsutsui, Seiko, to UBE Industries, Ltd. Wrapping film. 4,073,782, Cl. 260-23.00H.

Kishitani, Masatoshi; Tamagaki, Yoshiteru; Matsumoto, Takeji; Sugimoto, Mikio; and Namiki, Noriaki, to Kabushiki Kaisha Komatsu Seisakusho. System for laying a subterranean water impervious asphalt layer. 4,073,152, Cl. 61-63.000.

Kitajima, Masato: *See*—
Asaeda, Toshio; Suzuki, Ikuo; Imai, Tomoyasu; Kitajima, Masato; and Hota, Kazunori, 4,073,281, Cl. 125-11.0CD.

Kitajima, Tadayuki, to Canon Kabushiki Kaisha. Slit exposure device for use with a stationary original carriage. 4,073,584, Cl. 355-8.000.

Kitano, Hisao: *See*—
Handa, Susumu; Tanaka, Yoshiaki; Nishihata, Atsushi; Ueda, Sadashi; Inamoto, Yoshiaki; Tanimoto, Fumio; and Kitano, Hisao, 4,074,052, Cl. 544-221.000.

Kiuchi, Mitsuyuki; Amagami, Keizo; Mizukawa, Takumi; and Kominami, Hideyuki, to Matsushita Electric Industrial Co., Ltd. Induction heating apparatus using a pair of inversely parallel connected gate-controlled switching devices. 4,074,101, Cl. 219-10.49R.

Kiyokawa, Shin; Sakaguchi, Shokichi; and Takeuchi, Toru. Planar heating element. 4,074,222, Cl. 338-212.000.

Klein, Edgar; Kracke, Reinhard; Nespital, Walter; and Paul, Rudiger, deceased, to Kronos Titan G.m.b.H. Manufacture of titanium dioxide pigment seed from a titanium sulfate solution. 4,073,877, Cl. 423-616.000.

Klein, Schanzlin & Becker Aktiengesellschaft: *See*—
Schiele, Otto; and Florjancic, Dusan, 4,073,595, Cl. 415-143.000.

Klie, Wolfgang, to Daimler-Benz Aktiengesellschaft. Bumper for motor vehicles having a shock-absorbing profile. 4,073,528, Cl. 293-98.000.

Klinefelter, Nathan I. Device for pumping out sanded in crab pots. 4,073,079, Cl. 37-78.000.

Kling, Alberto. Wind driven power plant. 4,073,516, Cl. 290-55.000.

Klinge Pharma GmbH & Co.: *See*—
Grill, Helmut; Zschocke, Rainer Hans; Wagner, Josef; Hofrichter, Gernot; and Janiak, P. Stefan, 4,073,935, Cl. 424-308.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Fritsch, Walter; and Melcher, Gerhard, 4,073,645, Cl. 75-74.000.
Kryczun, Alfred; and Melcher, Gerhard, 4,073,646, Cl. 75-76.000.

Kloots, Jacobus, to Applied Fiberoptics, Inc. Method of making fiber-optic cable assembly. 4,073,050, Cl. 29-450.000.

Kluender, Harold Clinton: *See*—
Woessner, Warren Dexter; Sih, Charles John; Kluender, Harold Clinton; Arndt, Henry Clifford; and Biddlecom, William Gerard, 4,074,063, Cl. 560-121.000.

Knapp, Catherine. Amusement device. 4,073,504,.Cl. 280-220.000.

Knaub, Edgar W.: *See*—
Buckwalter, Mervin R.; and Knaub, Edgar W., 4,073,975, Cl. 427-170.000.

Kneitel, Dieter: *See*—
Roebke, Wolfgang; Kneitel, Dieter; and Parr, Erfried, 4,073,867, Cl. 423-429.000.

Knight, Clifford J., to Anderson, Lyle V., a part interest. Ceramic-paint coatings. 4,074,010, Cl. 428-422.000.

Knogo Corporation: *See*—
Minasy, Arthur J., 4,074,249, Cl. 340-280.000.

Knorr-Bremse GmbH: *See*—
Pollinger, Hans, 4,073,218, Cl. 92-85.00R.
Knox, Sidney G., to United States of America, Navy. Device for numerically displaying VOR bearing. 4,074,267, Cl. 343-106.00R.
Knudsen, Kenneth F., to American Chain & Cable Company, Inc. Power and free conveyor with engaging means operable on vertically curved sections of track. 4,073,238, Cl. 104-172.00S.
Knull, Kenneth L.: *See*—
Brown, Amos J.; Belshaw, Thomas E.; Knull, Kenneth L.; and Wilke, Wilbur D., 4,073,305, Cl. 137-140.000.
Knutson, Carlton N., to Construction Aids, Inc. Method and apparatus for installing panels in building construction. 4,073,109, Cl. 52-281.000.
Kobayashi, Tatsuo; and Miyazaki, Akira, to Rank Xerox Ltd. Sheet removing device for use in electrophotographic copying machine. 4,073,585, Cl. 355-14.000.
Kobayashi, Teruo: *See*—
Miyamoto, Akio; Matsukawa, Hiroharu; and Kobayashi, Teruo, 4,073,968, Cl. 427-54.000.
Kobayashi, Toshihiko: *See*—
Hayashi, Minoru; Ogino, Mineo; Kobayashi, Toshihiko; and Noda, Masaki, 4,074,090, Cl. 200-19.0DR.
Kobe, Inc.: *See*—
Erickson, John W.; and Williams, Carter P., 4,073,596, Cl. 415-180.000.
Kober, Kasimir, to Chicago Dryer Company. Folder construction. 4,073,486, Cl. 270-69.000.
Koch, Hans, to BBC Brown Boveri & Company, Limited. Gas turbine combustor fed by a plurality of primary combustion chambers. 4,073,134, Cl. 60-39.290.
Koch, Karlheinz; Kolaczinski, Gerhard; Rupilius, Wolfgang; and Stein, Werner, to Henkel KGaA; and Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Corrodible iron-containing surfaces carrying corrosion-inhibiting coating. 4,074,013, Cl. 428-457.000.
Kochs Adler AG: *See*—
Schrudde, Reinhold, 4,073,251, Cl. 112-256.000.
Kodric, Joseph, to Inventive Plastic Products Ltd. Shut-off valve for control of flow of molten plastic material. 4,073,469, Cl. 251-86.000.
Koehn, Wilbur R.; and Detwiler, John H. Rapid fire gun. 4,073,280, Cl. 124-72.000.
Koester, Eberhard; Wunsch, Gerd; Schoenafinger, Eduard; and Schneehage, Hans Henning, to BASF Aktiengesellschaft. Stabilization of pyrophoric metal powders with alkylene oxide polymers. 4,073,977, Cl. 427-216.000.
Koganei, Yoji: *See*—
Kakito, Akira; Yasui, Junichi; and Koganei, Yoji, 4,073,028, Cl. 15-102.000.
Kogo, Hiroshi; Kato, Tokuji; and Uematsu, Takashi, to Nissan Motor Company, Limited. Multi-channel video display apparatus using sequential circuit. 4,074,317, Cl. 358-181.000.
Kohler, Werner, to Siemens Aktiengesellschaft. Combined current and voltage measuring apparatus. 4,074,193, Cl. 324-126.000.
Koike, Yoshitaka: *See*—
Yabuta, Keiichiro; and Koike, Yoshitaka, 4,073,542, Cl. 303-6.00C.
Koizumi, Toshimichi, to Olympus Optical Co., Ltd. Objective for video disks. 4,073,575, Cl. 350-214.000.
Kojima, Yasuyuki; Tanno, Kiyohiko; Doi, Tetsuo; and Ono, Kunio, to Hitachi, Ltd. Thermal recording apparatus. 4,074,280, Cl. 346-76.00R.
Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Wada, Tasaku; and Nakabo, Satoru, 4,074,068, Cl. 178-23.00R.
Yokoi, Hiroshi; and Shiokawa, Takayasu, 4,074,266, Cl. 343-100.0SA.
Kolaczinski, Gerhard: *See*—
Koch, Karlheinz; Kolaczinski, Gerhard; Rupilius, Wolfgang; and Stein, Werner, 4,074,013, Cl. 428-457.000.
Kolatorowicz, Edwin E.: *See*—
Born, Norman E.; and Kolatorowicz, Edwin E., 4,074,175, Cl. 318-332.000.
Koll, Laurel A., to Mobilizer Medical Products, Inc. Transfer mechanism. 4,073,016, Cl. 5-81.00R.
Kollmorgen Technologies Corporation: *See*—
Herrmann, Gunther, 4,073,964, Cl. 427-10.000.
Polichette, Joseph; Leech, Edward J.; and Branigan, John G., 4,073,740, Cl. 252-156.000.
Kolosov, Ivan Alexandrovich. Automatic device for fixing the edge of a moving band. 4,073,448, Cl. 242-57.100.
Komatsu, Sadaharu, to Scriptomatic, Inc. Print position adjusting apparatus for address printer. 4,073,233, Cl. 101-132.500.
Kominami, Hideyuki: *See*—
Kiuchi, Mitsuyuki; Amagami, Keizo; Mizukawa, Takumi; and Kominami, Hideyuki, 4,074,101, Cl. 219-10.49R.
Komoto, Hiroshi: *See*—
Doi, Tsunesuke; Komoto, Hiroshi; Chono, Masazumi; Inoue, Akira; Saito, Kazuaki; and Shinozuka, Isao, 4,073,618, Cl. 21-2.70R.
Kondo, Eiji; and Mitsugi, Takashi, to Shionogi & Co., Ltd. Enzymatic acylation to afford β-lactam antibiotics. 4,073,687, Cl. 195-36.00P.
Kondo, Isao: *See*—
Matsuzaki, Soichiro; Maitani, Yoshihisa; Shimoyama, Kunio; and Kondo, Isao, 4,074,290, Cl. 354-34.000.
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Kondo, Shiro: *See*—
Sato, Masanobu; and Kondo, Shiro, 4,074,082, Cl. 179-100.110.
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Konovalov, Georgy Fedorovich: *See*—
Korshunov, Evgeny Alexeevich; Bainov, Nikolai Ivanovich; Petrov, Igor Nikolaevich; Konovalov, Georgy Fedorovich; Arshansky, Mikhail Iosipovich; Shmidt, Petr Genrikhovich; Kostrov, Valery Pavlovich; and Efremov, Petr Evgenievich, 4,073,333, Cl. 164-66.000.
Konrath, Karl: *See*—
Hofer, Gerald; and Konrath, Karl, 4,073,275, Cl. 123-139.0AF.
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Lim, Drahoslav; Kopecek, Jindrich; Bazilova nee Sverinova, Hedvika; and Vacik, Jiri, 4,074,039, Cl. 526-303.000.
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Franz, Arnold; and Kopnick, Siegfried, 4,074,015, Cl. 428-526.000.
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Koppe, Herbert: *See*—
Kummer, Werner; Koppe, Herbert; Stahle, Helmut; and Haarmann, Walter, 4,073,905, Cl. 424-248.560.
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Gardner, James J.; and Koppehele, Hugh Paul, 4,073,409, Cl. 222-146.0HE.
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Harris, Edward, 4,073,470, Cl. 251-163.000.
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Takagi, Nobuho; Takase, Mituo; Itoh, Takashi; Seno, Katsumi; and Koseki, Toshihiko, 4,073,594, Cl. 415-1.000.
Kostrov, Valery Pavlovich: *See*—
Korshunov, Evgeny Alexeevich; Bainov, Nikolai Ivanovich; Petrov, Igor Nikolaevich; Konovalov, Georgy Fedorovich; Arshansky, Mikhail Iosipovich; Shmidt, Petr Genrikhovich; Kostrov, Valery Pavlovich; and Efremov, Petr Evgenievich, 4,073,333, Cl. 164-66.000.
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Ohtani, Naoteru; Koyama, Tutomu; Takeuchi, Takashi; Azuma, Toshihiro; and Matsuda, Morio, 4,073,658, Cl. 106-92.000.
Koziol, Jeffrey E.: *See*—
Peyman, Gholam A.; and Koziol, Jeffrey E., 4,073,015, Cl. 3-13.000.
Kracke, Reinhard: *See*—
Klein, Edgar; Kracke, Reinhard; Nespital, Walter; and Paul, Rudiger, deceased, 4,073,877, Cl. 423-616.000.
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Stadie, Lothar; and Wittchow, Eberhard, 4,074,360, Cl. 364-551.000.
Kranco, Inc.: *See*—
Frank, Louis N., 4,073,476, Cl. 254-184.000.
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Herth, Harro; Kraus, Bernd; Sautter, Wilfried; and Wessel, Wolf, 4,073,269, Cl. 123-32.0EE.
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Erdmann, Dietrich; Eidenschink, Rudolf; Krause, Joachim; and Pohl, Ludwig, 4,073,742, Cl. 252-299.000.
Kravitz, Bernard L., to Dionics, Inc. High voltage PN junction and semiconductive devices employing same. 4,074,293, Cl. 357-34.000.
Kress, Robert F., to Dana Corporation. Marine propeller. 4,073,601, Cl. 416-242.000.
Krey Packing Company: *See*—
Adams, Jac, 4,073,686, Cl. 195-2.000.
Krohn, David A.: *See*—
Deeg, Emil W.; and Krohn, David A., 4,073,579, Cl. 351-169.000.
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Weisberg, Alfred M.; and Kroll, Harry, 4,073,700, Cl. 204-43.00G.

Krom, Cecil, Jr. Wood-splitting attachment. 4,073,325, Cl. 144-193.00A.

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Krooss, Robert J. Conveyor cleaning mechanism. 4,073,376, Cl. 198-498.000.

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Keck, Johannes; Puschmann, Sigfrid; Kruger, Gerd; Noll, Klaus-Reinhold; Leitold, Matyas; and Pieper, Helmut, 4,073,942, Cl. 424-330.000.

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Atsukawa, Masumi; Ushio, Hiroyuki; Kuwabara, Haruo; and Kubo, Kyoji, 4,073,864, Cl. 423-242.000.

Kuboshima, Makoto: *See*—
Munakata, Tsuneaki; and Kuboshima, Makoto, 4,074,296, Cl. 354-187.000.

Kuehn, Erich: *See*—
Ferrarini, James; and Kuehn, Erich, 4,073,828, Cl. 260-859.00R.

Kuehn, Lorne A.: *See*—
MacHattie, Lloyd E.; and Kuehn, Lorne A., 4,073,190, Cl. 73-339.00C.

Kuehn, Melvin C., to Ormite, Inc. Synthetic slate. 4,073,848, Cl. 264-120.000.

Kuge, Katutaro, to Tokyo Shibaura Electric Co., Ltd. Controlling apparatus for asynchronous motors with wound rotor. 4,074,174, Cl. 318-197.000.

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Kulicke, Frederick W., Jr.; Soffa, Albert; Vilenski, Dan; and Brockmann, Asher, 4,073,424, Cl. 228-4.500.

Kulieva, Zhanna Rustamovna, administrator: *See*—
Aliev, Vagab Safarovich; Markarian, Georgy Georgievich; Rustamov, Musa Ismail ogly; Pryanikov, Evgeny Ivanovich; Ismailova, Rustam Gadzhi Ali ogly, deceased; Ismailov, Amina Kyazim Kyzy, administrator; Ismailova, Ali Rustam ogly, administrator; Ismailova, Dzhulietta Rustamovna, administrator; and Kulieva, Zhanna Rustamovna, administrator, 4,073,717, Cl. 208-74.000.

Kumai, Ko; Asano, Koichi; and Bando, Hideharu, to Nippon Steel Corporation. Continuously cast steel slabs for steel sheets having excellent workabilities and method for production thereof. 4,073,643, Cl. 75-49.000.

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Chandler, Keith L.; Hyldon, Roy G.; Kumar, Surinder; and O'Mahony, John P., 4,073,948, Cl. 426-44.000.

Kummer, Werner; Koppe, Herbert; Stahle, Helmut; and Haarmann, Walter, to Boehringer Ingelheim GmbH. 2-Amino-4-phenyl-2-imidazolines and salts thereof. 4,073,905, Cl. 424-248.560.

Kuntz, Irving: *See*—
Powers, Kenneth W.; and Kuntz, Irving, 4,074,035, Cl. 526-185.000.

Kuo, Benjamin C.; Frus, John R.; and Singh, Gurdial, to Warner Electric Brake & Clutch Company. Position detection methods and apparatus for stepping motors. 4,074,179, Cl. 318-696.000.

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Yamauchi, Kazuhisa; Takakura, Koichi; Kawai, Syuji; and Ohmori, Akio, 4,073,733, Cl. 210-500.00M.

Kurioka, Hideo: *See*—
Saji, Yasuo; Kurioka, Hideo; Tanaka, Kozo; and Ogawa, Hiroyasu, 4,073,870, Cl. 423-447.600.

Kurozu, Toshio; and Hamada, Yoshikazu, to Mitsui Kinzoku Kogyo Kabushiki Kaisha. Noiseless latch for particular use on vehicle doors. 4,073,519, Cl. 292-216.000.

Kurtz, Arthur Peter, Jr.; and D'Silva, Themistocles D. J., to Union Carbide Corporation. Carbamoyloximes and oximes and insecticidal and miticidal compositions and methods employing them. 4,073,930, Cl. 424-277.000.

Kusano, Masaaki; Okuhara, Shinzi; and Ohhinata, Ichiro, to Hitachi, Ltd. Light-emitting diode element and device. 4,074,299, Cl. 357-17.000.

Kuschel, Konrad, to IFE Gesellschaft mbH. Electromagnetic vibrator with improved spring mounts. 4,074,154, Cl. 310-29.000.

Kushibe, Seijiro: *See*—
Fujita, Susumu; and Kushibe, Seijiro, 4,074,294, Cl. 354-106.000.

Kushida, Shozo: *See*—
Ikehata, Yukio; Ikenishi, Masataka; Kushida, Shozo; and Kikuchi, Tadahiro, 4,074,093, Cl. 200-52.00R.

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Barleon, Leopold; Dorner, Stefan; Goetzmann, Odo; and Kussmaul, Guenter, 4,073,682, Cl. 176-38.000.

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Atsukawa, Masumi; Ushio, Hiroyuki; Kuwabara, Haruo; and Kubo, Kyoji, 4,073,864, Cl. 423-242.000.

Kyoritsu Yuki Co., Ltd.: *See*—
Nishikaji, Takashi; Watanabe, Kenzo; and Sawayama, Shigeru, 4,074,041, Cl. 528-488.000.

Kyser, Edmond L.: *See*—
Dexter, John L.; Kyser, Edmond L.; Mitchell, Charles S.; and Sears, Stephan B., 4,074,284, Cl. 346-140.00R.

Laboratoire le Brun S.A.: *See*—
Quelet, Jean Raymond, 4,073,908, Cl. 424-253.000.

Lace, Melvin A., to Synchro-Start Products, Inc. Permanent magnet A.C. signal generator. 4,074,157, Cl. 310-67.00R.

Lacroix, Roger; and Haberli, Roland, to Ciba-Geigy Corporation. Stable dye solution. 4,073,615, Cl. 8-25.000.

Ladeil, Joshua; and Pitcher, Gerald Kennedy, to North American Philips Corporation. Automatic single crystal diffractometer. 4,074,132, Cl. 250-277.00R.

Ladenberger, Volker; Bronstert, Klaus; Hovemann, Friedrich; and Simak, Petr, to BASF Aktiengesellschaft. Lubricating oil compositions containing alkyl acrylate or methacrylate polymers and copolymers of styrene and conjugated diene. 4,073,738, Cl. 252-56.00R.

Lafferty, John Joseph: *See*—
Kaiser, Carl; and Lafferty, John Joseph, 4,073,912, Cl. 424-267.000.

Laffoon, Perry D.; and Boettcher, Robert L. Electric power generating apparatus. 4,074,145, Cl. 307-10.00R.

Laing, Nikolaus. Process and device for utilizing meteorological radiations. 4,073,284, Cl. 126-271.000.

Lakerveld, Herman Gerard; and van Rosmalen, Gerard Eduard, to U.S. Philips Corporation. Pivoting mirror device. 4,073,567, Cl. 350-6.500.

Lance, Richard T.: *See*—
Papafingos, Pandelis N.; and Lance, Richard T., 4,073,644, Cl. 75-68.00R.

Lane, Ramon; and Taub, Howard Hyman, to International Business Machines Corporation. Apparatus for acoustically synchronizing drop formation in an ink jet array. 4,074,277, Cl. 346-75.000.

Lang, Armin; and Fassbender, Rolf, to Zahnradfabrik Friedrichshafen AG. Connecting valve for reserve pump. 4,073,140, Cl. 60-405.000.

Lang-Ree, Nils, to N.P.I. Corporation. Rocking meatball cooker. 4,073,225, Cl. 99-339.000.

Lark, John C., to Standard Oil Company (Indiana). Hydrophilic finishing process for hydrophobic fibers. 4,073,993, Cl. 428-261.000.

Larson, Jay Michael: *See*—
Volin, Timothy Earl; Benjamin, John Stanwood; Larson, Jay Michael; and Cairns, Robert Lacock, 4,073,648, Cl. 75-245.000.

Lauer, Thomas R.: *See*—
Groth, Roger L.; Harvey, Randall L.; Lauer, Thomas R.; and Ronnebaum, Morris L., 4,073,346, Cl. 172-439.000.

Lauer, William; and Mouwen, Herman Charles, to Johnson & Johnson; and Purolator, Inc. Media for filtering blood. 4,073,732, Cl. 210-491.000.

Laufbahn, Jennie, to Schon, Henry A., a part interest. Catheter. 4,073,295, Cl. 128-295.000.

Laughlin, Robert Gene, to Procter & Gamble Company, The. Encapsulation process. 4,073,833, Cl. 264-4.000.

Laurel Bank Machine Co., Ltd.: *See*—
Uchida, Isamu, 4,073,488, Cl. 271-263.000.

Laurent, Henry: *See*—
Hofmeister, Helmut; Laurent, Henry; Wiechert, Rudolf; Annen, Klaus; and Steinbeck, Hermann, 4,073,900, Cl. 424-243.000.

Laurent, Jean, to Institut Francais du Petrole. Acoustic wave transducer with automatic compensation of the static pressure variations. 4,074,224, Cl. 340-8.0PC.

Lavigne, Vernon W.: *See*—
Bailey, James R.; and Lavigne, Vernon W., 4,073,563, Cl. 339-128.000.

Lawes, Norman Edward, to Imperial Chemical Industries Limited. Plastics bag. 4,073,429, Cl. 229-62.500.

Lawson, Frank; Ward, Denby Harcourt; and Kelly, Robert George, to Broken Hill Associated Smelters Proprietary Limited, The; and Monash University. Continuous sulphur drossing apparatus. 4,073,481, Cl. 266-215.000.

Lawson, Robert, to British Steel Corporation. Sampling gas for analysis. 4,073,619, Cl. 23-232.00R.

Lawson, William H., Jr. Electrical connector for submersible oil well pump cables. 4,073,559, Cl. 339-94.00R.

Layer, Robert Wesley: *See*—
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Lea, James F., to Sun Oil Company Limited. Ice removal system. 4,073,144, Cl. 61-1.00R.

Leaf, Harry Vincent; and Cassidy, Francis J., to Ark-Les Switch Corporation. Insulated wire splice. 4,074,065, Cl. 174-87.000.

Le Blanc, Destin Allen: *See*—
Le Blanc, Robert Bruce; and Le Blanc, Destin Allen, 4,073,617, Cl. 8-116.00P.

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Zangenfeind, Helmut; Burchardi, Jurgen; and Lederer, Josef, 4,073,588, Cl. 355-41.000.

Lee, Gim Fun, Jr.: *See*—
Katchman, Arthur; and Lee, Gim Fun, Jr., 4,073,765, Cl. 260-40.00R.

Leech, Edward J.: *See*—
Polichette, Joseph; Leech, Edward J.; and Branigan, John G., 4,073,740, Cl. 252-156.000.
Leeson Electric Corporation: *See*—
Widstrand, John C.; and Jurek, Dennis J., 4,074,156, Cl. 310-62.000.
Lehigh Products, Inc.: *See*—
Malott, Richard C., 4,073,106, Cl. 52-199.000.
Lehmann, Rolf: *See*—
Christ, Alfred; Lehmann, Rolf; and Miller, Helmut, 4,073,549, Cl. 308-9.000.
Lehtinen, Uuno Johannes. Shut off valve apparatus. 4,073,471, Cl. 251-176.000.
Leiblich, Gordon Francis. Structural panel. 4,073,112, Cl. 52-677.000.
Leigh, William Conrad, to Vitramon, Incorporated. Trimmable monolithic capacitors. 4,074,340, Cl. 361-321.000.
Leimgruber, Willy; and Valentine, Donald Herman, Jr., to Hoffmann-La Roche Inc. Process for the preparation of aldehydes. 4,073,811, Cl. 260-611.00A.
Leimgruber, Willy: *See*—
Batcho, Andrew David; Hengartner, Urs Oskar; Leimgruber, Willy; Scott, John William; and Valentine, Donald, Jr., 4,073,795, Cl. 260-326.14T.
Leitold, Matyas: *See*—
Keck, Johannes; Puschmann, Sigfrid; Kruger, Gerd; Noll, Klaus-Reinhold; Leitold, Matyas; and Pieper, Helmut, 4,073,942, Cl. 424-330.000.
Leitz, Julius H. Adjustable dredging and trenching apparatus. 4,073,078, Cl. 37-77.000.
Lennon, Thomas J., to GTE Sylvania Incorporated. Signal analyzer with noise estimation and signal to noise readout. 4,074,201, Cl. 325-363.000.
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Wollen, Carl H., 4,074,014, Cl. 428-506.000.
Lerich, Lester, to Wej-it Corporation. Anchor bolt with visual engagement indicator. 4,073,212, Cl. 85-79.000.
Lerman, Frank; and Bartsch, Raymond C., to National Distillers and Chemical Corporation. Printing on a polyolefin substrate. 4,073,992, Cl. 428-207.000.
Lermann, Peter, to AGFA-Gevaert, A.G. Camera shutter. 4,073,582, Cl. 352-141.000.
Lerner, Julius; and Iglesias, Edmundo J., to Suntech, Inc. System for calibrating a pump. 4,073,304, Cl. 137-101.210.
Leroux, Serge Andre, to Etablissements Leroux S.A. Method for bending thick profiled parts, part obtained thereby and application thereof to pane framings and the like. 4,073,177, Cl. 72-339.000.
Le Roy, Pierre L., to New Research & Development Lab., Inc. Wound clip. 4,073,298, Cl. 128-337.000.
Lester Construction Co.: *See*—
Dingess, Billy, 4,073,507, Cl. 280-477.000.
Lever Brothers Company: *See*—
Pader, Morton; and Netzbandt, William, 4,073,880, Cl. 424-66.000.
Lewis, Paul R., to Aluminum Company of America. Tear-off closure. 4,073,399, Cl. 215-254.000.
Lexnas, Sven-Olof, to Stilexo Johansson & Co. Aktiebolag. Door closing device. 4,073,033, Cl. 16-52.000.
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Li, Chi-Tang, to Owens-Illinois, Inc. Glasses, thermally stable high (beta)-cristobalite glass-ceramics and method. 4,073,655, Cl. 106-52.000.
Li, George S., to Standard Oil Company, The. Thermoplastic terpolymers of acrylonitrile, vinyl esters and indene. 4,074,037, Cl. 526-280.000.
Li, George S., to Standard Oil Company, The. Acrylonitrile-styrene-indene interpolymers. 4,074,038, Cl. 526-280.000.
Licata, Aurelio William, to Seton Name Plate Corporation. Color filling indicia simultaneously with debossing. 4,073,671, Cl. 156-219.000.
Licentia Patent-Verwaltungs-G.m.b.H.: *See*—
Steinert, Wolfgang; and Ekstrom, Bo, 4,074,119, Cl. 364-807.000.
Liddell, Arlyn G.: *See*—
Allred, James Kenneth; Liddell, Arlyn G.; Quinn, Edward Barney; and Black, Francis Bischoff, 4,074,120, Cl. 235-419.000.
Lieb, Erwin: *See*—
Wiest, Hubert; Berger, Rainer; and Lieb, Erwin, 4,073,779, Cl. 260-79.3MU.
Liebscher, Anton; Oberg, Sven; Smathers, Kenneth; and Auberry, Horace, to Ro-Search, Inc. Method of manufacture of footwear. 4,073,023, Cl. 12-142.0RS.
Lim, Drahoslav; Kopecek, Jindrich; Bazilova nee Sverinova, Hedvika; and Vacik, Jiri, to Ceskoslovenska akademie ved. Hydrophilic N,N-diethyl acrylamide copolymers. 4,074,039, Cl. 526-303.000.
Lincoln, Edgar Barry: *See*—
Little, Robert K.; and Lincoln, Edgar Barry, 4,073,467, Cl. 251-7.000.
Lindberg, Ulf Henrik Anders; Ross, Svante Bertil; Thorberg, Seth Olov; and Ogren, Sven Ove, to Astra Lakemedel Aktiebolag. Aralkyl amides having antidepressive activity. 4,073,941, Cl. 424-324.000.
Lindenthal, Hans: *See*—
Armasow, Waldemar; and Lindenthal, Hans, 4,073,139, Cl. 60-357.000.
Lindo, Neil A.: *See*—
Zinnes, Harold; Lindo, Neil A.; and Shavel, John, Jr., 4,074,048, Cl. 544-49.000.
Lindroth, Thomas A.; and Racciato, Joseph S., to Merck & Co., Inc. Printing paste compositions containing sodium cellulose sulfate, and processes therefor. 4,073,653, Cl. 106-26.000.
Linka, Adolf; and Hamma, Gerhard, to Mayer & Cie. Shuttle monitoring device, particularly for multiple-shuttle weaving machines. 4,073,319, Cl. 139-134.000.
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Imai, Makoto; Horiuchi, Teruo; and Kashiwa, Ichiro, 4,073,881, Cl. 424-70.000.
Lion Match Company Limited: *See*—
Pank, John C.; and Clegg, Ronald L. E., 4,073,326, Cl. 144-209.00R.
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List, Hans. Apparatus for transporting containers to and from a working station. 4,073,372, Cl. 198-341.000.
Little, Robert K.; and Lincoln, Edgar Barry, to RKL Controls, Inc. High pressure pinch valve. 4,073,467, Cl. 251-7.000.
Litton Business Systems, Inc.: *See*—
Caruso, Jerome, 4,073,539, Cl. 297-455.000.
Innes, Frank T., 4,074,332, Cl. 360-137.000.
Litton Systems, Inc.: *See*—
True, Richard Brownell, 4,074,265, Cl. 343-18.00E.
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Baraff, David Robbin; Boynton, Robert James; and Livermore, Frederick Caldwell, 4,074,109, Cl. 219-216.000.
Ljungberg, Stellan: *See*—
Wretlind, Karl Arvid Johannes; Ljungberg, Stellan; Hakansson, Ivan; and Ajaxon, Bengt Magnus, 4,073,943, Cl. 424-358.000.
Lockett, George E.: *See*—
Hunt, Paul S.; Elliott, James P.; Gulich, Johann F.; Weber, Max H.; Yampolsky, Jack S.; and Lockett, George E., 4,073,267, Cl. 122-32.000.
Loew, Peter: *See*—
Idstein, Hermann; and Loew, Peter, 4,073,489, Cl. 271-277.000.
Lof, George O. G., to Solaron Corporation. Modular construction for solar heat collector. 4,073,283, Cl. 126-270.000.
Lofmark, Bengt Gustav: *See*—
Eidsmo, Arne; and Lofmark, Bengt Gustav, 4,074,073, Cl. 179-15.0BP.
Loftin, Gordy E.: *See*—
Barnhart, David A.; and Loftin, Gordy E., 4,073,597, Cl. 415-201.000.
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Loge, Olaf: *See*—
Skuballa, Werner; Raduechel, Bernd; Vorbrueggen, Helmut; Elger, Walter; Loge, Olaf; and Schillinger, Eckehard, 4,073,934, Cl. 424-305.000.
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Long, David M., Jr., to University of Illinois Foundation. Brominated perfluorocarbon radiopaque agents. 4,073,879, Cl. 424-5.000.
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Ullrich, Hansjurgen; Dippel, Heinz; and Loss, Karl, 4,073,728, Cl. 210-71.000.
Lou, David Yuan Kong: *See*—
Balas, Charles, Jr.; Lou, David Yuan Kong; and Kenney, George Churchill, II, 4,074,282, Cl. 346-135.000.
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Lowry, James M.; and Azar, David, to Roadways International Corporation. Protecting rusty metal. 4,073,759, Cl. 260-28.5AS.
Lubbe, Bruno. Electric switch structure incorporating trip rod for sensing cable derailment and the like. 4,074,094, Cl. 200-61.130.
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Smith, Trevor Stanley; and Bloom, Joseph Louis, 4,073,135, Cl. 60-39.28R.
Lucas, James H.: *See*—
Plate, John R.; and Lucas, James H., 4,073,200, Cl. 74-501.00R.
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collar and use thereof in a tree trunk guying system. 4,073,090, Cl. 47-43.000.
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Metz, Gunter; and Specker, Manfred, 4,073,918, Cl. 424-270.000.
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Lundgren, Ernst Harry. Method and apparatus for automatic bacteriological cleaning and disinfection of objects. 4,073,663, Cl. 134-10.000.
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Lyman, George F., to Data Packaging Corporation. Leighton tube. 4,073,695, Cl. 195-127.000.
Lysobey, Morris, to RCA Corporation. Wide range frequency modulation of narrow loop bandwidth phase-locked oscillators. 4,074,209, Cl. 332-19.000.
Macawber Engineering Limited: *See*—
Snowdon, Brian, 4,073,244, Cl. 110-165.00R.
MacHattie, Lloyd E.; and Kuehn, Lorne A. Cold stress meter. 4,073,190, Cl. 73-339.00C.
Mack, Michael E.; and Northam, Donna B. C., to Jersey Nuclear-Avco Isotopes, Inc. Stabilized repetitively pulsed flashlamps. 4,074,208, Cl. 331-94.50P.
Mackinnon, Robert Ian, to Huntington Alloys, Inc. Liquid treatment of small articles. 4,073,301, Cl. 134-65.000.
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Magee, Judy Pat: *See*—
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Flaherty, John J., 4,074,186, Cl. 324-222.000.
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Miller, William George, 4,074,321, Cl. 358-31.000.
Magoulick, David M.: *See*—
Voos, Frank J.; and Magoulick, David M., 4,073,312, Cl. 137-877.000.
Magyar Vagon- es Gepgyar: *See*—
Szalai, Gabor, 4,073,358, Cl. 180-75.000.
Maher, William M.: *See*—
Schaeffer, Robert L.; and Maher, William M., 4,073,056, Cl. 30-123.500.
Maio, Kenji: *See*—
Takeuchi, Yasuhisa; Maio, Kenji; and Matsumoto, Junichiro, 4,073,545, Cl. 303-109.000.
Maitani, Yoshihisa: *See*—
Matsuzaki, Soichiro; Maitani, Yoshihisa; Shimoyama, Kunio; and Kondo, Isao, 4,074,290, Cl. 354-34.000.
Maki, Hiroshi: *See*—
Tabana, Minoru; Mitsuno, Tatsuyuki; Maki, Hiroshi; and Narisawa, Shizuo, 4,073,831, Cl. 260-876.00B.
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Mallatt, Russell C.: *See*—
Grutsch, James F.; Mallatt, Russell C.; and Steely, Benjamin F., 4,073,722, Cl. 210-5.000.
Malley, Frank: *See*—
Akers, Raymond F.; and Malley, Frank, 4,074,027, Cl. 429-10.000.
Malott, Richard C., to Lehigh Products, Inc. End cap and connectors for roof ridge ventilator. 4,073,106, Cl. 52-199.000.
Malovik, Vladlen Vasilievich: *See*—
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Eimers, Erich; Margotte, Dieter; Schmid, Helmut; and Dhein, Rolf, 4,073,769, Cl. 260-45.80R.
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Dumont, Maurice; and Marie, Gerard, 4,073,434, Cl. 237-2.00B.
Marine Electric Corporation: *See*—
Parke, Harry G.; and Tomsky, Harry W., 4,074,176, Cl. 318-371.000.
Mark, Victor, to General Electric Company. Non-opaque flame retardant polycarbonate composition. 4,073,768, Cl. 260-45.70S.
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Markem Corporation: *See*—
Areson, Peter D. W., 4,073,122, Cl. 53-131.000.
Marker, Hannes. Sailing mast for sailing boards. 4,073,254, Cl. 114-90.000.
Marshall, Joseph W.; and Gibson, Keith C., to British Steel Corporation. Roller guides. 4,073,173, Cl. 72-250.000.
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Ballman, Albert Anthony; Brown, Harold; Martin, John Martin; and Tien, Ping King, 4,073,675, Cl. 156-600.000.
Martin, Ronald Ray: *See*—
Womack, William B. M.; Starnes, Ralph Emory, Jr.; Headrick, John Charles; and Martin, Ronald Ray, 4,073,978, Cl. 427-235.000.
Martin, Ulrich, to Sandoz Ltd. Treating asthma. 4,073,915, Cl. 424-267.000.
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Martony, Juan Jose: *See*—
de Jager, Frank; and Martony, Juan Jose, 4,074,199, Cl. 325-50.000.
Marvel, John R.; and Mezick, James A., to Johnson & Johnson. Topical device for administering tretinoin. 4,073,291, Cl. 128-155.000.
Marvin Glass & Associates: *See*—
Barlow, Gordon A., 4,073,496, Cl. 274-9.00B.
Maryland Cup Corporation: *See*—
Brondyke, James R., 4,073,404, Cl. 221-63.000.
Maschinenfabrik Buckau R. Wolf Aktiengesellschaft: *See*—
Buzga, Heinrich; Steprath, Werner; and Pause, Kurt, 4,073,661, Cl. 134-1.000.
Masonite Corporation: *See*—
Clarke, John T.; Harker, Royce K.; Hittmeier, Michael E.; and Eaton, James W., 4,073,672, Cl. 156-219.000.
Mastandrea, John R. Transducer device. 4,073,193, Cl. 73-432.0PS.
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Yamaki, Naoomi; Futsuhara, Natsuko; Masuda, Kazue; and Tsuchimoto, Koji, 4,073,866, Cl. 423-405.000.
Masuda, Kenzo, to Hitachi, Ltd. Semiconductor read-only memory. 4,074,238, Cl. 365-104.000.
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Masunaga, Eiji: *See*—
Kouzai, Keiji; Tabe, Yutaka; Masunaga, Eiji; and Matsuda, Kichiro, 4,073,837, Cl. 264-38.000.
Matsubara, Shigeyoshi: *See*—
Wada, Motomu; Inoue, Masakazu; Furukawa, Kazunori; and Matsubara, Shigeyoshi, 4,073,844, Cl. 264-55.000.
Matsuda, Kichiro: *See*—
Kouzai, Keiji; Tabe, Yutaka; Masunaga, Eiji; and Matsuda, Kichiro, 4,073,837, Cl. 264-38.000.
Matsuda, Morio: *See*—
Ohtani, Naoteru; Koyama, Tutomu; Takeuchi, Takashi; Azuma, Toshihiro; and Matsuda, Morio, 4,073,658, Cl. 106-92.000.
Matsukawa, Hiroharu: *See*—
Miyamoto, Akio; Matsukawa, Hiroharu; and Kobayashi, Teruo, 4,073,968, Cl. 427-54.000.
Matsumoto, Junichiro: *See*—
Takeuchi, Yasuhisa; Maio, Kenji; and Matsumoto, Junichiro, 4,073,545, Cl. 303-109.000.
Matsumoto, Rempei: *See*—
Murota, Kozo; Matsumoto, Rempei; Yasuma, Toru; Morinaga, Mamoru; Tajima, Shigeo; Nakamura, Masayuki; and Sakaguchi, Akira, 4,073,361, Cl. 181-228.000.
Matsumoto, Takeji: *See*—
Kishitani, Masatoshi; Tamagaki, Yoshiteru; Matsumoto, Takeji; Sugimoto, Mikio; and Namiki, Noriaki, 4,073,152, Cl. 61-63.000.
Matsumoto, Yoshio: *See*—
Matsuo, Shunji; Sasaguri, Kiichiro; Nakamura, Katsuyuki; Matsumoto, Yoshio; and Sato, Mikio, 4,073,775, Cl. 260-47.0EP.
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Griffey, Donald E., 4,074,323, Cl. 358-243.000.
Kiuchi, Mitsuyuki; Amagami, Keizo; Mizukawa, Takumi; and Kominami, Hideyuki, 4,074,101, Cl. 219-10.49R.
Mitsugi, Itaru; and Hayakawa, Toshio, 4,074,089, Cl. 200-5.00E.

Otake, Hiroshi; Koresawa, Saburo; and Hashimoto, Kozo, 4,074,210, Cl. 333-29.000.
Sakumoto, Hideki; and Namoto, Yoshiteru, 4,074,329, Cl. 360-85.000.
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Mayer, Max, 4,073,324, Cl. 144-82.000.
Mayer & Cie: *See*—
Linka, Adolf; and Hamma, Gerhard, 4,073,319, Cl. 139-134.000.
Mayer, Franz: *See*—
Gebauer, Gerhard; Brandrup, Johannes; Kraft, Kurt; and Mayer, Franz, 4,074,007, Cl. 428-411.000.
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Kandul, Jury Vasilievich; Semeny, Valery Yakovlevich; Pivovarov, Mikhail Danilovich; Malovik, Vladlen Vasilievich; Mazepa, Ivan Karpovich; and Feschenko, Ninel Gavrilovna, 4,073,809, Cl. 260-606.50P.
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McCabe-Powers Body Company: *See*—
Fox, Charles W., 4,074,234, Cl. 340-171.00R.
McCall, Francis J. Apparatus for acupressure treatment. 4,073,296, Cl. 128-303.00R.
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Bartrug, Norman G.; and McDaniel, Donald L., 4,073,849, Cl. 264-236.000.
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Christensen, Carl; Hause, Arthur Dickson; and McDonald, Henry Stanton, 4,074,072, Cl. 179-15.0AQ.
McDonald, Ruth, successor: *See*—
Dibler, Carson E., deceased; McDonald, Ruth, successor; and Cowan, Owen O., 4,073,392, Cl. 214-83.100.
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Gibson, Sandra F., 4,073,690, Cl. 195-100.000.
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McKenney's, Inc.: *See*—
Arrowood, Gordon W., 4,073,018, Cl. 4-191.000.
McKenzie, Roland W.; and Stansberry, Richard, to City Tank Corporation. Control system for refuse packer assembly. 4,073,393, Cl. 214-83.300.
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Bosworth, Clive J.; Bridgstock, Neil E.; Stone, Raymond S.; and McLaughlin, William L., 4,073,260, Cl. 118-8.000.
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McLean, Ellis J., Sr., 4,073,887, Cl. 424-147.000.
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McMahon, Roy C. Method and apparatus for improving energy fuels. 4,073,273, Cl. 123-119.00E.
McMahon, Roy C.: *See*—
Means, Eldon A.; and McMahon, Roy C., 4,073,712, Cl. 204-186.000.
McWhorter, Delmer L. Truck bumper attachment. 4,073,082, Cl. 40-591.000.
MDA Scientific, Inc.: *See*—
Bull, Rame; Denenberg, Byron A.; and Popovic, Djorde R., 4,073,621, Cl. 23-254.00E.
Mead Corporation, The: *See*—
Brown, Glendon W.; Fine, Mary Jane; and Hill, Larry O., 4,073,748, Cl. 252-428.000.
Robertson, John A., 4,074,278, Cl. 346-75.000.
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Popper, Karel; Camirand, Wayne M.; Williams, Gerald S.; and Mecchi, Edward P., 4,073,747, Cl. 252-412.000.
Medical Development Corporation: *See*—
Stanley, James Robert; and Topham, Silas Charles, 4,073,294, Cl. 128-278.000.
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Basmajian, Vahan V., 4,073,069, Cl. 35-13.000.
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Melcher, Gerhard: *See*—
Fritsch, Walter; and Melcher, Gerhard, 4,073,645, Cl. 75-74.000.
Kryczun, Alfred; and Melcher, Gerhard, 4,073,646, Cl. 75-76.000.
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Melcher, Robert Lee; and Shiren, Norman Steven, to International Business Machines Corporation. Magnetoelastic storage device. 4,074,240, Cl. 365-192.000.
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Banucci, Eugene G.; and Mellinger, Gary A., 4,073,773, Cl. 260-47.0CP.
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Mena, Joseph M. Closure lock with inflatable bladder. 4,073,521, Cl. 292-256.650.
Mena, Peter M.: *See*—
Miller, David H.; and Mena, Peter M., 4,074,187, Cl. 324-51.000.
Menapace, Henry R.: *See*—
Wang, Jin-Liang; Brown, Melvin; and Menapace, Henry R., 4,073,820, Cl. 260-683.00D.
Mercer, James B. Therapeutic treatment for viral regional ileitis infection. 4,073,928, Cl. 424-273.00R.
Merck & Co., Inc.: *See*—
Callery, Patrick S.; Wright, Jeremy; and Zenker, Nicolas, 4,073,929, Cl. 424-273.00R.
Fisher, Michael H.; and Ruyle, William V., 4,073,791, Cl. 260-294.80R.
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Midler, Michael, Jr.; and Paul, Edward, 4,073,743, Cl. 252-309.000.
Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
Bodart, Detlef Eugen, 4,073,623, Cl. 23-259.000.
Erdmann, Dietrich; Eidenschink, Rudolf; Krause, Joachim; and Pohl, Ludwig, 4,073,742, Cl. 252-299.000.
Mercury Machine Company: *See*—
Petrenchik, John R., 4,073,609, Cl. 425-442.000.
Mergl, Milos: *See*—
Forman, Ladislav; Mergl, Milos; Mostecky, Jiri; Teply, Milos; and Uher, Jiri, 4,073,688, Cl. 195-49.000.
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Merkle & Associates, Inc.: *See*—
Merkle, Frank P., Jr., 4,073,243, Cl. 110-99.00R.
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Gosau, Dieter, 4,073,452, Cl. 244-118.00R.
Messman, Leonard A.; Wooding, Harold C., Jr.; and Waehner, Glenn C., to United Technologies Corporation. Labeled container orientation processor. 4,074,130, Cl. 250-223.00R.
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Belser, Karl Arnold; and Metz, Philip Bradshaw, 4,074,254, Cl. 340-324.0AD.
Meyer, Carl H. W.: *See*—
Ehrsam, William Friedrich; Meyer, Carl H. W.; Smith, John Lynn; and Tuchman, Walter Leonard, 4,074,066, Cl. 178-22.000.
Meyer, Larry P., to Nelson Irrigation Corporation. Sprinkler head. 4,073,438, Cl. 239-227.000.
Mezick, James A.: *See*—
Marvel, John R.; and Mezick, James A., 4,073,291, Cl. 128-155.000.
Miami Footwear Corporation: *See*—
Rabin, Harry H.; and Aquino, Florencio P., 4,073,074, Cl. 36-104.000.
Midler, Michael, Jr.; and Paul, Edward, to Merck & Co., Inc. Process for preparing an emulsion. 4,073,743, Cl. 252-309.000.
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Miles Laboratories, Inc.: *See*—
Woessner, Warren Dexter; Sih, Charles John; Kluender, Harold Clinton; Arndt, Henry Clifford; and Biddlecom, William Gerard, 4,074,063, Cl. 560-121.000.
Miller, David H.; and Mena, Peter M. Cable tester for multi-pair shielded cables. 4,074,187, Cl. 324-51.000.
Miller, David William, to Pandrol Limited. Railway rail-fastening clip and a railway rail-and-fastening assembly employing it. 4,073,435, Cl. 238-349.000.
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Buckley, Frederick, III; Creamer, Malcom Kenneth, Jr.; and Miller, Gerald Aberdeen, 4,074,150, Cl. 307-362.000.
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Miller, Helmut: *See*—
Christ, Alfred; Lehmann, Rolf; and Miller, Helmut, 4,073,549, Cl. 308-9.000.

Miller, Leroy J.: *See*—
Grinberg, Jan; and Miller, Leroy J., 4,073,571, Cl. 350-337.000.

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Cook, Darwen John; and Millers, Donald Alexander, II, 4,074,352, Cl. 364-200.000.

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Tolan, John R., 4,073,420, Cl. 226-42.000.

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Minichev, Vasily Mikhailovich; Simis, Evgeny Moiseevich; and Judin, Vladimir Konstantinovich. Pole assembly of a dynamoelectric machine. 4,074,161, Cl. 310-194.000.

Minnesota Mining and Manufacturing Company: *See*—
Bateson, George F.; Brown, Francis W.; and Heilmann, Steven M., 4,074,004, Cl. 428-355.000.
Bryan, Thomas Toplica; and Pluim, Arthur William, Jr., 4,073,999, Cl. 428-311.000.
Close, James R.; and Johnson, James R., 4,073,318, Cl. 138-149.000.
Heikkinen, Duane G.; and Kanten, Thomas M., 4,074,012, Cl. 428-425.000.
Sanders, James F., 4,074,009, Cl. 428-421.000.
Sandvig, Timothy C., 4,073,967, Cl. 427-44.000.
Stevens, John, 4,074,051, Cl. 544-140.000.

Minolta Camera Kabushiki Kaisha: *See*—
Ueda, Hiroshi; and Yoshizaki, Akira, 4,074,291, Cl. 354-51.000.

Mitchell, Charles S.: *See*—
Dexter, John L.; Kyser, Edmond L.; Mitchell, Charles S.; and Sears, Stephan B., 4,074,284, Cl. 346-140.00R.

Mitchell, John Davis: *See*—
Jordan, Bertram Lee; and Mitchell, John Davis, 4,073,124, Cl. 56-1.000.
Jordan, Bertram Lee; and Mitchell, John Davis, 4,073,378, Cl. 198-627.000.

Mitra, Panchanan, to Ciba-Geigy Corporation. Method of forming narrow ribbons of fibers in plastic material. 4,073,670, Cl. 156-179.000.

Mitrofanov, Evgeny Sergeevich: *See*—
Rundkvist, Konstantin Alexandrovich; Ivanov, Nikolai Alexeevich; Ivanov, Boris Gavrilovich; Zarogatsky, Leonid Petrovich; Mitrofanov, Evgeny Sergeevich; and Blekhman, Ilya Izrailevich, 4,073,446, Cl. 241-207.000.

Mitsubishi Chemical Industries Limited: *See*—
Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Okamoto, Shosuke; and Hijikata, Akiko, 4,073,914, Cl. 424-267.000.
Nishikaji, Takashi; Watanabe, Kenzo; and Sawayama, Shigeru, 4,074,041, Cl. 528-488.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,891, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,892, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,913, Cl. 424-267.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,916, Cl. 424-267.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Kawamura, Hiroshi; Nishitani, Yoshihisa; and Muta, Katsumi, 4,074,315, Cl. 358-142.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Atsukawa, Masumi; Ushio, Hiroyuki; Kuwabara, Haruo; and Kubo, Kyoji, 4,073,864, Cl. 423-242.000.

Mitsubishi Kinzoku K.K.: *See*—
Fukushima, Seitaro, 4,073,874, Cl. 423-500.000.

Mitsubishi Paper Mills, Ltd.: *See*—
Yamada, Shoji; Tanaka, Akira; Horii, Shoichi; and Yamashita, Kiyoshi, 4,073,651, Cl. 96-100.00R.

Mitsubishi Rayon Company, Limited: *See*—
Murakami, Fumiki; Teshima, Soichi; and Yokoyama, Toshihiko, 4,074,062, Cl. 560-217.000.

Mitsugi, Itaru; and Hayakawa, Toshio, to Matsushita Electric Industrial Co., Ltd. Multiple push-switch apparatus having flexible element preventing simultaneous actuator depression. 4,074,089, Cl. 200-5.00E.

Mitsugi, Takashi: *See*—
Kondo, Eiji; and Mitsugi, Takashi, 4,073,687, Cl. 195-36.00P.

Mitsui Kinzoku Kogyo Kabushiki Kaisha: *See*—
Kurozu, Toshio; and Hamada, Yoshikazu, 4,073,519, Cl. 292-216.000.

Mitsuno, Tatsuyuki: *See*—
Tabana, Minoru; Mitsuno, Tatsuyuki; Maki, Hiroshi; and Narisawa, Shizuo, 4,073,831, Cl. 260-876.00B.

Miyabayashi, Yoshiyuki; and Tsuchiya, Yoshimasa, to Nissan Motor Company, Limited. Remotely actuated lock arrangement for motor vehicle. 4,073,170, Cl. 70-256.000.

Miyagawa Kasei Industry Co., Ltd.: *See*—
Miyagawa, Shiro, 4,074,025, Cl. 429-91.000.

Miyagawa, Shiro, to Miyagawa Kasei Industry Co., Ltd. Indicating device for storage battery. 4,074,025, Cl. 429-91.000.

Miyamoto, Akio; Matsukawa, Hiroharu; and Kobayashi, Teruo, to Fuji Photo Film Co., Ltd. Method for desensitization of a color developer. 4,073,968, Cl. 427-54.000.

Miyazaki, Akira: *See*—
Kobayashi, Tatsuo; and Miyazaki, Akira, 4,073,585, Cl. 355-14.000.

Miyazawa, Yoshihide: *See*—
Ozutsumi, Minoru; Miyazawa, Yoshihide; and Yamaguchi, Masahiko, 4,073,614, Cl. 8-25.000.
Ozutsumi, Minoru; Miyazawa, Yoshihide; and Yamaguchi, Masahiko, 4,074,050, Cl. 544-92.000.

Mizokami, Shigeyoshi: *See*—
Ichikawa, Hiroshi; Sugimoto, Michio; Mizokami, Shigeyoshi; Honna, Kosaku; and Sugahara, Hirozo, 4,073,818, Cl. 260-668.00F.

Mizukawa, Takumi: *See*—
Kiuchi, Mitsuyuki; Amagami, Keizo; Mizukawa, Takumi; and Kominami, Hideyuki, 4,074,101, Cl. 219-10.49R.

Mizutani, Taketomo; Yasunori, Takaharu; and Yoshimi, Kazuyoshi, to Sanyo Electric Co., Ltd. Ceiling fan. 4,073,598, Cl. 416-5.000.

Mobil Oil Corporation: *See*—
Schick, John W.; and Davis, Robert H., 4,073,736, Cl. 252-31.000.

Mobilizer Medical Products, Inc.: *See*—
Koll, Laurel A., 4,073,016, Cl. 5-81.00R.

Mobius, Christian Hermann. Method of removing tannins and reducing clouding in drinks. 4,073,954, Cl. 426-330.300.

Mochida, Yukou; Ogawa, Tadao; and Yamaguchi, Kazuo, to Fujitsu Limited. Optical PCM group transmission repeating system. 4,074,127, Cl. 250-199.000.

Modes, Edward, to Powers Regulator Company. Control apparatus for warm up cycle of air distribution system. 4,073,433, Cl. 236-49.000.

Moedritzer, Kurt, to Monsanto Company. Phosphorus flame retardant compositions. 4,073,829, Cl. 260-860.000.

Moffett, Robert Bruce, to Upjohn Company, The. Certain astriazino[4,3-a][1,4]benzodiazepine-1,2-dione compounds. 4,073,784, Cl. 260-243.300.

Moffett, Robert Bruce: *See*—
Evenson, Gerald Norman; and Moffett, Robert Bruce, 4,073,785, Cl. 260-243.300.

Mohan, Arthur Gaudens, to American Cyanamid Company. Process for azoles (ring closure of nitro compounds). 4,074,046, Cl. 542-439.000.

Molins, Desmond Walter, to Molins Limited. Method of making Russian cigarettes. 4,073,300, Cl. 131-61.00A.

Molins Limited: *See*—
Hinchcliffe, Dennis; Daisley, Robert Thomas; Harper, Stanley Bernard; and Kilborn, Hilary Mark How'l, 4,073,374, Cl. 198-425.000.
Molins, Desmond Walter, 4,073,300, Cl. 131-61.00A.

Molins Machine Company, Inc.: *See*—
Coburn, Robert E., 4,073,222, Cl. 93-36.00M.

Monarch Marking Systems, Inc.: *See*—
Dobras, Bruce W., 4,074,114, Cl. 235-463.000.

Monash University: *See*—
Lawson, Frank; Ward, Denby Harcourt; and Kelly, Robert George, 4,073,481, Cl. 266-215.000.

Monsanto Company: *See*—
Baatz, James C.; and Donermeyer, Donald D., 4,073,994, Cl. 428-265.000.
Baatz, James C.; and Donermeyer, Donald D., 4,073,995, Cl. 428-265.000.
Birum, Gail H., 4,073,767, Cl. 260-45.80R.
Martins, Joseph G.; and Donermeyer, Donald D., 4,073,973, Cl. 427-142.000.
Moedritzer, Kurt, 4,073,829, Cl. 260-860.000.

Montanteme, Jean; Greffe, Andre; and Grandjacques, Francois, to Societe Francaise d'Electrometallurgie. Selective reduction of nickel ore with a low nickel content. 4,073,641, Cl. 75-11.000.

Montazeau, Francois: *See*—
Doubovetzky, Serge; Forschner, Peter; and Montazeau, Francois, 4,073,806, Cl. 260-544.00K.

Moore, Arthur H., to Bridgeport Metal Goods Manufacturing Company, The. Fluorescent lantern. 4,074,122, Cl. 362-200.000.

Moore, Billie G.: *See*—
Harrison, George W.; and Moore, Billie G., 4,073,836, Cl. 264-36.000.

Moore, Charles H. Process of forging large seamless ferrous-metal welding necks and other cylindrical articles. 4,073,174, Cl. 72-254.000.

Moore, Ricky L.; and Hagborg, Winston E., to West Point-Pepperell Inc. Flock treatment. 4,074,005, Cl. 428-378.000.
Moorhouse, John H. Lock structure. 4,073,171, Cl. 70-366.000.
Moreland, Stephen T. Bridge bid recording device. 4,073,493, Cl. 273-148.00R.
Moretto, Hans-Heinrich; de Montigny, Armand; Thom, Karl-Friedrich; and Schliebs, Reinhard, to Bayer Aktiengesellschaft. Process for the preparation of linear and branched chlorosiloxanes. 4,073,801, Cl. 260-448.20E.
Morewood, William Henry: *See—*
Reisner, John Henry; Morewood, William Henry; and Riddle, George Herbert Needham, 4,074,313, Cl. 358-128.000.
Morgan, Chester S., to United States of America, Energy. Preparation of cermets. 4,073,647, Cl. 75-235.000.
Moriconi, Dario J., to Sperry, Raymond L.; and Sperry, Selma. Trash compactor. 4,073,227, Cl. 100-52.000.
Morikawa, Masanobu: *See—*
Okasaka, Hotsuma; Nakamura, Kiyokazu; Morikawa, Masanobu; Tsunashima, Kenji; and Soda, Atsuhiko, 4,073,827, Cl. 260-835.000.
Morinaga, Mamoru: *See—*
Murota, Kozo; Matsumoto, Rempei; Yasuma, Toru; Morinaga, Mamoru; Tajima, Shigeo; Nakamura, Masayuki; and Sakaguchi, Akira, 4,073,361, Cl. 181-228.000.
Morioka, Masao: *See—*
Nishida, Takeshi; Morioka, Masao; Ohta, Tetsuro; and Yamakawa, Yukio, 4,073,988, Cl. 428-91.000.
Moriyama, Hideo, to Moriyama Sangyo Kabushiki Kaisha. Decorative light source including a discharge lamp and resistor within an outer envelope. 4,074,165, Cl. 313-112.000.
Moriyama Sangyo Kabushiki Kaisha: *See—*
Moriyama, Hideo, 4,074,165, Cl. 313-112.000.
Morokuma, Tadashi: *See—*
Kakinuma, Yoshikazu; and Morokuma, Tadashi, 4,074,306, Cl. 358-1.000.
Morse Electro Products Corporation: *See—*
Berger, Bernard, 4,074,327, Cl. 360-74.000.
Morse, Henry William: *See—*
Webb, Paul Dale; and Morse, Henry William, 4,073,607, Cl. 418-86.000.
MOS Technology, Inc.: *See—*
Paivinen, John O.; and Eisenhower, Walter D., 4,074,301, Cl. 357-23.000.
Moskowitz, George. Adjustable blocking means for dosage regulation. 4,073,321, Cl. 141-27.000.
Mosler Safe Company, The: *See—*
Oder, Charles D.; and Doehlman, Harold G., 4,073,554, Cl. 312-199.000.
Moss, Margurita L., to Raymond Lee Organization, Inc., The. Comfort quilt. 4,074,107, Cl. 219-212.000.
Mostecky, Jiri: *See—*
Forman, Ladislav; Mergl, Milos; Mostecky, Jiri; Teply, Milos; and Uher, Jiri, 4,073,688, Cl. 195-49.000.
Motorola, Inc.: *See—*
Aichholzer, Ronald Albert, 4,074,214, Cl. 333-73.00S.
Davis, Earl Klimer; Rogers, William Oakley; and Silvis, Duane Charles, 4,073,657, Cl. 106-73.500.
Henry, Tim Warren, 4,074,257, Cl. 340-347.0NT.
Motz, Herbert: *See—*
Hack, Joachim; Schaefer, Dieter; and Motz, Herbert, 4,074,002, Cl. 428-331.000.
Mouwen, Herman Charles: *See—*
Lauer, William; and Mouwen, Herman Charles, 4,073,732, Cl. 210-491.000.
Mulkey, Dennis A.; and Brown, C. Kepler, Jr. Attachment for sewing machines and a method of making overlapped stitches. 4,073,249, Cl. 112-212.000.
Muller, Hans. Apparatus for combined cooling and aeration of biochemical-action vessels. 4,073,696, Cl. 195-142.000.
Muller, Johann; Weerth, Hans Ernst; and Staudenrausch, Georg, to Handtmann, Albert. Apparatus for the production of sausage. 4,073,039, Cl. 17-1.00F.
Muller, Jurgen; Rheude, Alfred; and Schmidt, Manfred, to AGFA-Gevaert, A.G. Ionography imaging chamber. 4,074,133, Cl. 250-315.00A.
Muller, Kurt; Richter, Friedrich; and Schramm, Heinz-Helmut, to Siemens Aktiengesellschaft. Encapsulated, gas-insulated high-voltage apparatus having increased resistance to arc activity. 4,074,064, Cl. 174-28.000.
Multi-Pak Corporation: *See—*
O'Rourke, James; and Feldberg, Murray, 4,073,229, Cl. 100-98.00R.
Munakata, Tsuneaki; and Kuboshima, Makoto, to Fuji Photo Film Co., Ltd. Folding camera. 4,074,296, Cl. 354-187.000.
Munk, Edmund E., to Werzalit Pressholzwerk J.F. Werz K.G. Method of making molded bodies from ligno-cellulose particles. 4,073,851, Cl. 264-109.000.
Munson, Lowell W.: *See—*
Coope, Robert L.; and Munson, Lowell W., 4,073,215, Cl. 90-58.00R.
Munt, Irwin, to Sangamo Weston, Inc. Display excitation and updating circuit. 4,074,255, Cl. 340-336.000.
Murakami, Fumiki; Teshima, Soichi; and Yokoyama, Toshihiko, to Mitsubishi Rayon Company, Limited. Process for producing unsaturated carboxylic acid esters. 4,074,062, Cl. 560-217.000.
Murakami, Kanemichi; Ishida, Yoshihiro; and Okubo, Kazuo, to Shinko Electric Company, Ltd. A.C. Relay system. 4,074,333, Cl. 361-13.000.
Murata, Shuhei. Three-dimensional embroidered article and the method for the production of the same. 4,073,299, Cl. 128-425.000.
Murayama, Fumio: *See—*
Hosoda, Minoru; Kasiwagi, Eiichi; Murayama, Fumio; and Isayama, Kohei, 4,073,762, Cl. 260-29.300.
Murayama, Kuniki: *See—*
Sakai, Yoshiaki; and Murayama, Kuniki, 4,074,325, Cl. 360-39.000.
Murison, Alexander Smith: *See—*
O'Reilly, James Michael; and Murison, Alexander Smith, 4,074,331, Cl. 360-104.000.
Murota, Junichi: *See—*
Sakai, Tetsushi; Sakakibara, Yutaka; Murota, Junichi; and Wada, Tsutomu, 4,074,300, Cl. 357-23.000.
Murota, Kozo; Matsumoto, Rempei; Yasuma, Toru; Morinaga, Mamoru; Tajima, Shigeo; Nakamura, Masayuki; and Sakaguchi, Akira, to Fuji Jukogyo Kabushiki Kaisha. Muffler for motor vehicles. 4,073,361, Cl. 181-228.000.
Murrell, Lawrence L.: *See—*
Yates, David J. C.; and Murrell, Lawrence L., 4,073,750, Cl. 252-459.000.
Musser, Harry Robert, to Eastman Kodak Company. Unsaturated polyester containing formal linkages. 4,074,061, Cl. 560-193.000.
Mustapick, Andrew James. Automated merchandising system. 4,073,368, Cl. 186-1.00C.
Muta, Katsumi: *See—*
Kawamura, Hiroshi; Nishitani, Yoshihisa; and Muta, Katsumi, 4,074,315, Cl. 358-142.000.
Myers, David M., to Curtiss-Wright Corporation. Rotary combustion engine with side housing by-pass passages. 4,073,268, Cl. 123-8.130.
Mysels, Karol J., to General Atomic Company. Method of making nuclear fuel elements. 4,073,834, Cl. 264-0.500.
N. J. Phillips Pty. Limited: *See—*
Phillips, Ian Ross; and Reynolds, Mervyn Frank, 4,073,293, Cl. 128-223.000.
N.P.I. Corporation: *See—*
Lang-Ree, Nils, 4,073,225, Cl. 99-339.000.
Naaijer, Geert Jan, to U.S. Philips Corporation. Peak detecting with constant fractional offset. 4,074,149, Cl. 307-351.000.
Naarmann, Herbert; Penzien, Klaus; and Gausepohl, Hermann, to BASF Aktiengesellschaft. Manufacture of heat-stable brominated oligomers of monovinyl-aromatic compounds. 4,074,032, Cl. 526-44.000.
Nadal, Guy, to Saft-Societe des Accumulateurs Fixes et de Traction. Casing of an electric cell. 4,074,022, Cl. 429-54.000.
Nadir, Mark T., to Macklin, Kenneth E. Novel bistable light modulators and display element and arrays therefrom. 4,074,253, Cl. 340-324.00M.
Nagasawa, Shigeru: *See—*
Yotsuyanagi, Yoshihiko; Araki, Naganori; Nagasawa, Shigeru; and Okitsu, Toshinao, 4,073,756, Cl. 260-18.00N.
Nagase, Minoru, to Nippon Air Brake Company, Ltd., The. Electropneumatic control apparatus for an electric/friction brake blending system. 4,073,541, Cl. 303-3.000.
Nagata, Susumu: *See—*
Nakagawa, Mutsuaki; Wakasa, Yutaka; Uchiike, Hisayuki; and Nagata, Susumu, 4,074,354, Cl. 364-200.000.
Nagy, Zoltan, to Diamond Shamrock Corporation. Brine treatment for trace metal removal. 4,073,706, Cl. 204-98.000.
Nakabo, Satoru: *See—*
Wada, Tasaku; and Nakabo, Satoru, 4,074,068, Cl. 178-23.00R.
Nakagawa, Mutsuaki; Wakasa, Yutaka; Uchiike, Hisayuki; and Nagata, Susumu, to Yokogawa Electric Works, Ltd. Process control system. 4,074,354, Cl. 364-200.000.
Nakagawa, Yasuhiko: *See—*
Yamazaki, Masafumi; and Nakagawa, Yasuhiko, 4,073,271, Cl. 123-75.00B.
Nakajima, Yasuo: *See—*
Aoyama, Syunichi; and Nakajima, Yasuo, 4,073,202, Cl. 74-860.000.
Nakajima, Yoshiyuki: *See—*
Akito, Eiichiro; Nakajima, Yoshiyuki; and Horioka, Masayoshi, 4,073,931, Cl. 424-298.000.
Nakamoto, Soichi; Ito, Tadashi; Ito, Fumio; and Isobe, Yasuo, to Canon Kabushiki Kaisha. System for indicating photographic information. 4,074,292, Cl. 354-53.000.
Nakamura, Katsuyuki: *See—*
Matsuo, Shunji; Sasaguri, Kiichiro; Nakamura, Katsuyuki; Matsumoto, Yoshio; and Sato, Mikio, 4,073,775, Cl. 260-47.0EP.
Nakamura, Kiyokazu: *See—*
Okasaka, Hotsuma; Nakamura, Kiyokazu; Morikawa, Masanobu; Tsunashima, Kenji; and Soda, Atsuhiko, 4,073,827, Cl. 260-835.000.
Nakamura, Masayuki: *See—*
Murota, Kozo; Matsumoto, Rempei; Yasuma, Toru; Morinaga, Mamoru; Tajima, Shigeo; Nakamura, Masayuki; and Sakaguchi, Akira, 4,073,361, Cl. 181-228.000.
Nakamura, Michiharu: *See—*
Aiki, Kunio; Nakamura, Michiharu; and Umeda, Junichi, 4,073,676, Cl. 156-624.000.
Nakanishi Conveyors Co. Ltd.: *See—*
Wakabayashi, Takao, 4,073,237, Cl. 104-172.00C.
Nakayama, Mutumi: *See—*
Soga, Mitsuo; Takase, Yuuzo; Ishikawa, Manabu; Nakazawa, Masahiko; and Nakayama, Mutumi, 4,074,034, Cl. 526-56.000.
Nakayama, Yasuharu; Watanabe, Tadashi; Yamashita, Yoshio; Aihara, Tetsuo; and Toyomoto, Isao, to Kansai Paint Company, Limited. Emulsion compositions. 4,073,758, Cl. 260-23.0EP.

Nakazawa, Masahiko: *See*—
Soga, Mitsuo; Takase, Yuuzo; Ishikawa, Manabu; Nakazawa, Masahiko; and Nakayama, Mutumi, 4,074,034, Cl. 526-56.000.
Nalco Chemical Company: *See*—
Tai, Wun Ten, 4,073,763, Cl. 260-29.4UA.
Namiki, Noriaki: *See*—
Kishitani, Masatoshi; Tamagaki, Yoshiteru; Matsumoto, Takeji; Sugimoto, Mikio; and Namiki, Noriaki, 4,073,152, Cl. 61-63.000.
Namoto, Yoshiteru: *See*—
Sakumoto, Hideki; and Namoto, Yoshiteru, 4,074,329, Cl. 360-85.000.
Nampoothiri, C. N. Damodaran: *See*—
Earls, David E.; and Nampoothiri, C. N. Damodaran, 4,073,133, Cl. 58-13.000.
Napco Security Systems, Inc.: *See*—
Stockdale, Roy, 4,074,248, Cl. 340-276.000.
Narisawa, Shizuo: *See*—
Tabana, Minoru; Mitsuno, Tatsuyuki; Maki, Hiroshi; and Narisawa, Shizuo, 4,073,831, Cl. 260-876.00B.
Nash, Dudley O.; and Clayton, Thomas S., to General Electric Company. Gas turbine engine nozzle apparatus including a nozzle flap slot seal. 4,073,441, Cl. 239-265.410.
National Blank Book Company, Inc.: *See*—
Cassidy, Raymond T., 4,073,553, Cl. 312-184.000.
National Distillers and Chemical Corporation: *See*—
Lerman, Frank; and Bartsch, Raymond C., 4,073,992, Cl. 428-207.000.
Voos, Frank J.; and Magoulick, David M., 4,073,312, Cl. 137-877.000.
National Instrument Company, Inc.: *See*—
Bennett, Richard Nelson, 4,073,322, Cl. 141-169.000.
National Research Development Corporation: *See*—
Broadway, Alexander Richard William, 4,074,160, Cl. 310-184.000.
Bunting, Walter, 4,074,190, Cl. 324-77.00A.
Fleischmann, Martin; Goodridge, Francis; and Vance, Christopher John, 4,073,702, Cl. 204-59.00R.
Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek Ten Behoeve Van Nijverheid Handel en Verkeer: *See*—
Ritter, Fridolin J., 4,073,882, Cl. 424-84.000.
Nee, Paul, to Roger Pelleray. Method for the automatic manufacture of pressurized or liquefied gas tanks. 4,074,106, Cl. 219-137.00R.
Nelson Irrigation Corporation: *See*—
Meyer, Larry P., 4,073,438, Cl. 239-227.000.
Nelson, Iver L., to Champion International Corporation. Taping apparatus. 4,073,119, Cl. 53-76.000.
Nelson, Lyle C. Ball-operated labyrinthic lock. 4,073,169, Cl. 70-166.000.
Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-3,7-inter-m-phenylene-11-deoxy-PGE$_1$ compounds. 4,073,805, Cl. 260-590.00C.
Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-aminomethyl-PGA and 9-deoxy-9,10-didehydro-PGD analogs. 4,073,808, Cl. 260-563.00R.
Nespital, Walter: *See*—
Klein, Edgar; Kracke, Reinhard; Nespital, Walter; and Paul, Rudiger, deceased, 4,073,877, Cl. 423-616.000.
Nestler, Heinz; and Plankl, Leo Hans, to Dynamit Nobel Aktiengesellschaft. Surface protection for porous materials. 4,073,972, Cl. 427-136.000.
Netzbandt, William: *See*—
Pader, Morton; and Netzbandt, William, 4,073,880, Cl. 424-66.000.
Neuper, Helmut: *See*—
Gulas, Hans-Jurgen; and Neuper, Helmut, 4,073,656, Cl. 106-57.000.
New Research & Development Lab., Inc.: *See*—
Le Roy, Pierre L., 4,073,298, Cl. 128-337.000.
Newman, David P., to Yellow Springs Instrument Company, Inc., The. Membrane for enzyme electrodes. 4,073,713, Cl. 204-195.00B.
Newman, Gerald H.: *See*—
Malachesky, Paul A.; and Newman, Gerald H., 4,074,019, Cl. 429-50.000.
Newton, Robert E.: *See*—
Dechene, Ronald L.; Grimaldi, Frank G.; and Newton, Robert E., 4,074,184, Cl. 324-30.00R.
Neyer, Robert D., to Yarway Corporation. Steam trap. 4,073,306, Cl. 137-183.000.
Nicholas International Limited: *See*—
Suh, John T., 4,073,798, Cl. 260-340.50R.
Nicolls, Wilfrid Edward Walter, to Cav Limited. Fuel injection pumping apparatus. 4,073,276, Cl. 123-139.00E.
Niederost, Werner; and Durrer, Bernhard, to Cerberus AG. Interlocked separable fire sensor construction. 4,074,341, Cl. 361-331.000.
Nieuwenhoven, Hendricus Jacobus Cornelis: *See*—
van der Lely, Cornelis; and Nieuwenhoven, Hendricus Jacobus Cornelis, 4,073,099, Cl. 52-69.000.
Nikkel, Kermit: *See*—
Keller, Herman F., 4,074,252, Cl. 340-321.000.
Nikkel, Leon: *See*—
Keller, Herman F., 4,074,252, Cl. 340-321.000.
Nilsson, Sven Walter: *See*—
Lundgren, Bengt; and Nilsson, Sven Walter, 4,073,547, Cl. 308-6.00C.
Nippon Air Brake Company, Ltd., The: *See*—
Nagase, Minoru, 4,073,541, Cl. 303-3.000.
Nippon Electric Company, Ltd.: *See*—
Furuya, Tadashi, 4,074,198, Cl. 325-3.000.
Otomo, Koju; Itoh, Takeshi; Hayashi, Kazuyuki; Omoto, Hiroshi; Yui, Takayuki; and Suzuki, Makoto, 4,074,232, Cl. 340-147.00R.
Shiba, Hiroshi, 4,074,304, Cl. 357-59.000.
Nippon Kayaku Kabushiki Kaisha: *See*—
Akito, Eiichiro; Nakajima, Yoshiyuki; and Horioka, Masayoshi, 4,073,931, Cl. 424-298.000.
Nippon Seal Co., Ltd.: *See*—
Tsuruzawa, Teruya; and Ueda, Muneyuki, 4,073,027, Cl. 15-172.000.
Nippon Steel Corporation: *See*—
Kumai, Ko; Asano, Koichi; and Bando, Hideharu, 4,073,643, Cl. 75-49.000.
Teramae, Akira; Yamada, Koji; and Kawasaki, Hironobu, 4,074,011, Cl. 428-422.000.
Nippon Telegraph and Telephone Public Corporation: *See*—
Ishida, Akira, 4,074,236, Cl. 365-200.000.
Otomo, Koju; Itoh, Takeshi; Hayashi, Kazuyuki; Omoto, Hiroshi; Yui, Takayuki; and Suzuki, Makoto, 4,074,232, Cl. 340-147.00R.
Sakai, Tetsushi; Sakakibara, Yutaka; Murota, Junichi; and Wada, Tsutomu, 4,074,300, Cl. 357-23.000.
Tokura, Yoichi; and Hashimoto, Shinichiro, 4,074,069, Cl. 179-1.0SC.
Nippondenso Co., Ltd.: *See*—
Endo, Kunio, 4,073,270, Cl. 123-32.0EB.
Sugiura, Akio; and Nojiri, Tadao, 4,074,115, Cl. 235-462.000.
Nishida, Takeshi; Morioka, Masao; Ohta, Tetsuro; and Yamakawa, Yukio, to Kanebo, Ltd. Suede-like artificial leathers and a method for manufacturing same. 4,073,988, Cl. 428-91.000.
Nishida, Yukiaki: *See*—
Yasuda, Koichi; Ikeda, Yusuke; and Nishida, Yukiaki, 4,073,883, Cl. 424-94.000.
Nishihata, Atsushi: *See*—
Handa, Susumu; Tanaka, Yoshiaki; Nishihata, Atsushi; Ueda, Sadashi; Inamoto, Yoshiaki; Tanimoto, Fumio; and Kitano, Hisao, 4,074,052, Cl. 544-221.000.
Nishikaji, Takashi; Watanabe, Kenzo; and Sawayama, Shigeru, to Mitsubishi Chemical Industries Limited; and Kyoritsu Yuki Co., Ltd. Process for preparing solid water soluble polymers. 4,074,041, Cl. 528-488.000.
Nishino, Makoto: *See*—
Otsuki, Akira; and Nishino, Makoto, 4,073,835, Cl. 264-22.000.
Nishioka, Kunihiko: *See*—
Kiritani, Yoshio; Tsuyuguchi, Michio; Ibaragi, Tetsuo; Yano, Katsuhiro; Sunami, Yoshihiko; Nishioka, Kunihiko; and Sumikin Coke Company Limited, 4,073,625, Cl. 44-10.00R.
Nishitani, Yoshihisa: *See*—
Kawamura, Hiroshi; Nishitani, Yoshihisa; and Muta, Katsumi, 4,074,315, Cl. 358-142.000.
Nissan Motor Company, Limited: *See*—
Aoyama, Syunichi; and Nakajima, Yasuo, 4,073,202, Cl. 74-860.000.
Fujiki, Norio; and Endo, Hiroshi, 4,073,359, Cl. 180-98.000.
Hira, Kazumi, 4,073,534, Cl. 296-37.160.
Kogo, Hiroshi; Kato, Tokuji; and Uematsu, Takashi, 4,074,317, Cl. 358-181.000.
Miyabayashi, Yoshiyuki; and Tsuchiya, Yoshimasa, 4,073,170, Cl. 70-256.000.
Saito, Masaaki, 4,073,274, Cl. 123-119.00R.
Takeuchi, Yasuhisa; Maio, Kenji; and Matsumoto, Junichiro, 4,073,545, Cl. 303-109.000.
Tsuchiya, Yoshimasa; and Fujii, Hiroshi, 4,073,520, Cl. 292-216.000.
Watanabe, Kuniyuki, 4,073,360, Cl. 180-104.000.
Yabuta, Keiichiro; and Koike, Yoshitaka, 4,073,542, Cl. 303-6.00C.
Yamazaki, Masafumi; and Nakagawa, Yasuhiko, 4,073,271, Cl. 123-75.00B.
Nissen, Norman C.: *See*—
Huggins, David A.; and Nissen, Norman C., 4,073,860, Cl. 423-140.000.
Nitta, Tomio, to Tokai Seiki Co., Ltd. Disposable cigarette gas lighter. 4,073,612, Cl. 431-126.000.
Noakes, Michael J.: *See*—
Kuhn, Martin C.; Stephens, John A.; Noakes, Michael J.; and Rovig, Allen D., 4,073,479, Cl. 266-173.000.
Nobel Hoechst Chimie: *See*—
Christidis, Yani; and Depernet, Dominique, 4,074,054, Cl. 548-335.000.
Nobusawa, Tsukumo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera exposure control system adapter to adjust both the diaphragm and the shutter. 4,074,289, Cl. 354-23.00D.
Noda, Masaki: *See*—
Hayashi, Minoru; Ogino, Mineo; Kobayashi, Toshihiko; and Noda, Masaki, 4,074,090, Cl. 200-19.0DR.
Noda, Yasuo; and Inoue, Takaya, to Kansai Kagaku Kikai Seisaku Kabushiki Kaisha. Reversibly rotated wiper in an evaporator. 4,073,677, Cl. 159-6.00W.
Noguchi, Masaru, to Fuji Photo Film Co. Beam scanning device using a stationary hologram. 4,073,566, Cl. 350-3.710.
Nojiri, Tadao: *See*—
Sugiura, Akio; and Nojiri, Tadao, 4,074,115, Cl. 235-462.000.
Noll, Klaus-Reinhold: *See*—
Keck, Johannes; Puschmann, Sigfrid; Kruger, Gerd; Noll, Klaus-Reinhold; Leitold, Matyas; and Pieper, Helmut, 4,073,942, Cl. 424-330.000.
Nomiya, Kosei; and Hotta, Shinkichi, to Hitachi, Ltd. Key input circuit. 4,074,262, Cl. 340-365.00S.
Nomura, Takeshi. Water gate control system. 4,073,147, Cl. 61-26.000.

Nordberg, Svein T.; and Shaner, Donald R., to GTE Sylvania Incorporated. Mounting means for a circuit breaker. 4,074,219, Cl. 337-186.000.
Nordsiek, Karl-Heinz: *See—*
Berg, Gerhard; and Nordsiek, Karl-Heinz, 4,073,755, Cl. 260-17.4BB.
Nordskog Company Inc.: *See—*
Nordskog, Robert A., 4,073,369, Cl. 188-5.000.
Nordskog, Robert A., to Nordskog Company Inc. Brake and tie-down mechanism. 4,073,369, Cl. 188-5.000.
Noren, Tore H. Dishwasher with downwardly movable door counterbalanced by spring-biased toggle joints. 4,073,555, Cl. 312-229.000.
Norlin Music, Inc.: *See—*
Swain, Richard Slaughter, 4,074,233, Cl. 340-147.0LP.
Norsk Hydro a.s: *See—*
Roed, Finn, 4,073,714, Cl. 204-243.00R.
North American Philips Corporation: *See—*
Balas, Charles, Jr.; Lou, David Yuan Kong; and Kenney, George Churchill, II, 4,074,282, Cl. 346-135.000.
Bastian, Robert Edward, 4,073,576, Cl. 350-273.000.
Ladell, Joshua; and Pitcher, Gerald Kennedy, 4,074,132, Cl. 250-277.00R.
Northam, Donna B. C.: *See—*
Mack, Michael E.; and Northam, Donna B. C., 4,074,208, Cl. 331-94.50P.
Northern Telecom Limited: *See—*
Baraff, David Robbin; Boynton, Robert James; and Livermore, Frederick Caldwell, 4,074,109, Cl. 219-216.000.
Debortoli, George; and Zimmermann, Detlef, 4,074,337, Cl. 361-124.000.
Walling, Jorg-Hein; and Jukes, John Alan, 4,073,265, Cl. 118-634.000.
Norton, David Gibbons; and Wright, Gary Thorup, to International Business Machines Corporation. Flexible disk storage apparatus. 4,074,330, Cl. 360-102.000.
Norwood Marking and Equipment Co., Inc.: *See—*
Shenoha, James L., 4,073,117, Cl. 53-14.000.
Novak, Arthur F.: *See—*
Bailey, August V.; Boudreaux, Gordon J.; Sumrell, Gene; and Novak, Arthur F., 4,074,058, Cl. 560-105.000.
Novotny, John: *See—*
Westdale, Virgil W.; and Novotny, John, 4,073,980, Cl. 428-404.000.
Nuclear Battery Corporation: *See—*
Barr, Harold N., 4,073,665, Cl. 136-202.000.
Numatics, Incorporated: *See—*
McGeachy, Donald E., 4,073,311, Cl. 137-513.300.
Nussbaum, Ralph W.: *See—*
Tuller, Harold W.; and Nussbaum, Ralph W., 4,074,036, Cl. 526-238.000.
Nusslein, Ludwig: *See—*
Arndt, Friedrich; and Nusslein, Ludwig, 4,073,793, Cl. 260-306.80D.
Nutter, Charles E.: *See—*
Richards, David O.; Jones, Isaac P.; Duffee, Homer W.; and Nutter, Charles E., 4,073,997, Cl. 428-285.000.
Nyberg, David Dolph, to Raychem Corporation. Poly(tetramethyleneterephthalate) crosslinked by irradiation. 4,073,830, Cl. 260-860.000.
Nystrom, K. Sture, to Skega Aktiebolag. Flexible flow diverter. 4,073,316, Cl. 137-829.000.
Oberg, Sven: *See—*
Liebscher, Anton; Oberg, Sven; Smathers, Kenneth; and Auberry, Horace, 4,073,023, Cl. 12-142.0RS.
O'Brien, John G.; and Calderazzo, Franklin J., to Pitney-Bowes, Inc. Sheet jogger. 4,073,391, Cl. 214-65.000.
O'Brien, John P. Golf training device. 4,073,075, Cl. 36-127.000.
Occidental Oil Shale, Inc.: *See—*
Underwood, Gene E., 4,073,352, Cl. 175-53.000.
Oce-van der Grinten, N.V.: *See—*
Peters, Martinus T. J., 4,073,739, Cl. 252-62.10P.
O'Connor, Michael Niall Desmond: *See—*
Panzer, Hans Peter; O'Connor, Michael Niall Desmond; and Baccei, Louis J., 4,074,055, Cl. 548-347.000.
O'Connor, Terence James, to Bay Mills Limited. Scrim/foil laminate. 4,073,998, Cl. 428-310.000.
Oder, Charles D.; and Doehlman, Harold G., to Mosler Safe Company, The. Modular safety deposit box system. 4,073,554, Cl. 312-199.000.
Odin, Jacques: *See—*
Chaussy, Jacques; Bret, Jean-Louis; Berton, Adrien; and Odin, Jacques, 4,074,343, Cl. 363-14.000.
Oeder, Dieter; Gropper, Hans; and Urban, Friedrich, to BASF Aktiengesellschaft. Manufacture of ethylene polymers in an autoclave reactor. 4,074,040, Cl. 526-352.000.
Oertel, Harald: *See—*
Buysch, Hans-Josef; Oertel, Harald; and Roos, Ernst, 4,073,746, Cl. 252-404.000.
Offermanns, Heribert: *See—*
Bertram, Heidrun; Fahnenstich, Rudolf; Offermanns, Heribert; and Tanner, Herbert, 4,073,945, Cl. 426-2.000.
vonBebenburg, Walter; and Offermanns, Heribert, 4,073,792, Cl. 260-296.00H.
Ogawa, Hiroyasu: *See—*
Saji, Yasuo; Kurioka, Hideo; Tanaka, Kozo; and Ogawa, Hiroyasu, 4,073,870, Cl. 423-447.600.
Ogawa, Iwakichi, to Takara Co., Ltd. Vehicle toy. 4,073,086, Cl. 46-91.000.
Ogawa, Kazuo: *See—*
Kishi, Hidehiro; Harakawa, Hiroshi; Ogawa, Kazuo; and Tsutsui, Seiko, 4,073,782, Cl. 260-23.00H.
Ogawa, Tadao: *See—*
Mochida, Yukou; Ogawa, Tadao; and Yamaguchi, Kazuo, 4,074,127, Cl. 250-199.000.
Ogino, Mineo: *See—*
Hayashi, Minoru; Ogino, Mineo; Kobayashi, Toshihiko; and Noda, Masaki, 4,074,090, Cl. 200-19.0DR.
Ogren, Sven Ove: *See—*
Lindberg, Ulf Henrik Anders; Ross, Svante Bertil; Thorberg, Seth Olov; and Ogren, Sven Ove, 4,073,941, Cl. 424-324.000.
O'Hare, Louis R. Electric generation by light-variable capacitance. 4,074,129, Cl. 250-212.000.
Ohhinata, Ichiro: *See—*
Kusano, Masaaki; Okuhara, Shinzi; and Ohhinata, Ichiro, 4,074,299, Cl. 357-17.000.
Ohkawa, Isao: *See—*
Kawashima, Hidetoshi; Ohtake, Shinzaburo; Fujimori, Toru; Ohkawa, Isao; and Tajima, Tetsuya, 4,073,910, Cl. 424-266.000.
Ohkubo, Kazuo: *See—*
Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Okamoto, Shosuke; and Hijikata, Akiko, 4,073,914, Cl. 424-267.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,891, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,892, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,913, Cl. 424-267.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,916, Cl. 424-267.000.
Ohmori, Akio: *See—*
Yamauchi, Kazuhisa; Takakura, Koichi; Kawai, Syuji; and Ohmori, Akio, 4,073,733, Cl. 210-500.00M.
Ohmori, Yukio: *See—*
Kimura, Minoru; Tango, Hiroyuki; and Ohmori, Yukio, 4,073,055, Cl. 29-583.000.
Ohsawa, Mitsuo, to Sony Corporation. Circuit for demodulating a stereo signal. 4,074,075, Cl. 179-15.0BT.
Ohta, Tetsuro: *See—*
Nishida, Takeshi; Morioka, Masao; Ohta, Tetsuro; and Yamakawa, Yukio, 4,073,988, Cl. 428-91.000.
Ohtake, Shinzaburo: *See—*
Kawashima, Hidetoshi; Ohtake, Shinzaburo; Fujimori, Toru; Ohkawa, Isao; and Tajima, Tetsuya, 4,073,910, Cl. 424-266.000.
Ohtani, Naoteru; Koyama, Tutomu; Takeuchi, Takashi; Azuma, Toshihiro; and Matsuda, Morio, to Kao Soap Co., Ltd. Hydraulic cement composition. 4,073,658, Cl. 106-92.000.
Ohuchi, Yoshio: *See—*
Ikeda, Takatoshi; and Ohuchi, Yoshio, 4,074,279, Cl. 346-75.000.
Okabe, Kenji, to Toyo Cloth Co., Ltd. Method for imparting a lustrous top surface to artificial leather. 4,073,984, Cl. 427-444.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, to Mitsubishi Chemical Industries Limited; and Okamoto, Shosuke. N^2-arylsulfonyl-L-argininamides and the pharmaceutically acceptable salts thereof. 4,073,891, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, to Mitsubishi Chemical Industries Limited; and Okamoto, Shosuke. N^2-alkoxynaphthylsulfonyl-L-argininamides and the pharmaceutically acceptable salts thereof. 4,073,892, Cl. 424-177.000.
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Okamoto, Shosuke: *See—*
Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo. Kazuo; Tezuka, Tohru; Tonomura, Shinji; Okamoto, Shosuke; and Hijikata, Akiko, 4,073,914, Cl. 424-267.000.
Okamoto, Yoshiyuki; Wang, Joseph Y.; and Chou, Eng J., to Polytechnic Institute of New York. Removal of trinitrotoluene from aqueous media. 4,073,726, Cl. 210-45.000.
Okamuro, James A., to Borroughs Tool & Equipment Corporation. Piston pin installing and removing method. 4,073,051, Cl. 29-427.000.
Okasaka, Hotsuma; Nakamura, Kiyokazu; Morikawa, Masanobu; Tsunashima, Kenji; and Soda, Atsuhiko, to Toray Industries, Inc. Thermoplastic resinous composition. 4,073,827, Cl. 260-835.000.
Oki Electric Industry Co., Ltd.: *See—*
Otomo, Koju; Itoh, Takeshi; Hayashi, Kazuyuki; Omoto, Hiroshi; Yui, Takayuki; and Suzuki, Makoto, 4,074,232, Cl. 340-147.00R.

Okino, Katsumoto: *See*—
Yasujima, Nobuo; Arai, Juichiro; Itokawa, Natsuo; and Okino, Katsumoto, 4,073,971, Cl. 427-103.000.

Okitsu, Toshinao: *See*—
Yotsuyanagi, Yoshihiko; Araki, Naganori; Nagasawa, Shigeru; and Okitsu, Toshinao, 4,073,756, Cl. 260-18.00N.

Okubo, Kazuo: *See*—
Murakami, Kanemichi; Ishida, Yoshihiro; and Okubo, Kazuo, 4,074,333, Cl. 361-13.000.

Okuhara, Shinzi: *See*—
Kusano, Masaaki; Okuhara, Shinzi; and Ohhinata, Ichiro, 4,074,299, Cl. 357-17.000.

Olabode, Hamilton A.: *See*—
Standing, Charles N.; and Olabode, Hamilton A., 4,073,952, Cl. 426-242.000.

Olig, Eugene A., to Giddings & Lewis, Inc. Methods and apparatus for automatic movement of a member to precisely indexed positions despite signal drift or offset. 4,074,177, Cl. 318-602.000.

Olin Corporation: *See*—
Caron, Ronald N.; and Shapiro, Stanley, 4,073,667, Cl. 148-12.70C.
Zwirlein, John F., 4,073,664, Cl. 134-18.000.

Olson, Roy H., to Hoffman Electronics Corporation. Electronically scanned antenna. 4,074,268, Cl. 343-106.00R.

Olympus Optical Co., Ltd.: *See*—
Kakinuma, Yoshikazu; and Morokuma, Tadashi, 4,074,306, Cl. 358-1.000.
Koizumi, Toshimichi, 4,073,575, Cl. 350-214.000.
Matsuzaki, Soichiro; Maitani, Yoshihisa; Shimoyama, Kunio; and Kondo, Isao, 4,074,290, Cl. 354-34.000.
Sato, Masaaki, 4,073,451, Cl. 242-191.000.
Sato, Masanobu; and Kondo, Shiro, 4,074,082, Cl. 179-100.110.

O'Mahony, John P.: *See*—
Chandler, Keith L.; Hyldon, Roy G.; Kumar, Surinder; and O'Mahony, John P., 4,073,948, Cl. 426-44.000.

Omley, Herbert A., to Omley Industries, Inc. Furniture clip attachment device. 4,073,423, Cl. 227-7.000.

Omley Industries, Inc.: *See*—
Omley, Herbert A., 4,073,423, Cl. 227-7.000.

Omoto, Hiroshi: *See*—
Otomo, Koju; Itoh, Takeshi; Hayashi, Kazuyuki; Omoto, Hiroshi; Yui, Takayuki; and Suzuki, Makoto, 4,074,232, Cl. 340-147.00R.

O'Neill, George J.; and Pacifici, James G., to Eastman Kodak Company. Radiation crosslinkable polyester and polyesteramide compositions containing sulfonate groups in the form of a metallic salt and unsaturated groups. 4,073,777, Cl. 260-75.00S.

Ono, Kunio: *See*—
Kojima, Yasuyuki; Tanno, Kiyohiko; Doi, Tetsuo; and Ono, Kunio, 4,074,280, Cl. 346-76.00R.

Ookawa, Taro; and Takeda, Shuichi, to Yoshida Kogyo K.K. Soundproof door. 4,073,093, Cl. 49-381.000.

Optiz, Wolfgang; and Hennen, Hans, to Hoechst Aktiengesellschaft. Joint combustion of off-gases and liquid residues containing chlorinated hydrocarbons with hydrochloric acid recovery. 4,073,871, Cl. 423-481.000.

Orange, A. C. Push-in can top. 4,073,403, Cl. 220-269.000.

Orban, Jean M., to Vivitar Corporation. Voltage regulator with thermal overload protection. 4,074,170, Cl. 315-120.000.

O'Reilly, James Michael; and Murison, Alexander Smith, to Burroughs Corporation. Magnetic recording head structure for recording on both sides of a record member. 4,074,331, Cl. 360-104.000.

Orlandi, John F.; and Rauch, John E., to Belden Corporation. Twining and cabling system. 4,073,127, Cl. 57-58.360.

Ormand, Frederick T.: *See*—
Marancik, William G.; and Ormand, Frederick T., 4,073,666, Cl. 148-11.50Q.

Ormite, Inc.: *See*—
Kuehn, Melvin C., 4,073,848, Cl. 264-120.000.

Oronzio de Nora Impianti Elettrochimici, S.p.A.: *See*—
De Nora, Oronzio; and De Nora, Vittorio, 4,073,715, Cl. 204-256.000.

O'Rourke, James; and Feldberg, Murray, to Multi-Pak Corporation. Vertical waste compacting apparatus. 4,073,229, Cl. 100-98.00R.

Orr, James Douglas: *See*—
Karapita, Alexander Donald; and Orr, James Douglas, 4,073,456, Cl. 248-337.000.

Ostrin, Albert. Golf ball retriever. 4,073,529, Cl. 294-19.00A.

Ostrowski, Jerzy; Sierputowski, Piotr; Turkowski, Lukasz; Jablkiewicz, Jerzy; Pacholski, Jan; and Jedryka, Tadeusz, to Centralny Osrodek Badawczo-Rozwojowy Maszyn Wlokienniczych. Method and apparatus for manufacturing of yarn. 4,073,128, Cl. 57-58.890.

Ostrowski, Jerzy; Sierputowski, Piotr; Turkowski, Lukasz; Jablkiewicz, Jerzy; Pacholski, Jan; and Jedryka, Tadeusz, to Centralny Osrodek Badawczo-Rozwojowy Maszyn Wlokienniczych. Method and apparatus for manufacture of yarn. 4,073,129, Cl. 57-58.890.

Otake, Hiroshi; Koresawa, Saburo; and Hashimoto, Kozo, to Matsushita Electric Industrial Co., Ltd. Distribution type delay line. 4,074,210, Cl. 333-29.000.

Otomo, Koju; Itoh, Takeshi; Hayashi, Kazuyuki; Omoto, Hiroshi; Yui, Takayuki; and Suzuki, Makoto, to Hitachi, Ltd.; Nippon Telegraph and Telephone Public Corporation; Oki Electric Industry Co., Ltd.; Nippon Electric Company, Ltd.; and Fujitsu Limited. Data sending and receiving system for packet switching network. 4,074,232, Cl. 340-147.00R.

Otsuki, Akira; and Nishino, Makoto, to Toyo Ink Manufacturing Co., Ltd. Method of resin encapsulating electrical parts with UV curing of fire retardant resin. 4,073,835, Cl. 264-22.000.

Otsuki, Tatsukiyo; and Takata, Sinya. Method for producing yellow hydrated ferric oxide. 4,073,878, Cl. 423-633.000.

Otto Durr, Firma: *See*—
Gutjahr, Rolf, 4,073,063, Cl. 34-32.000.

Oudot, Pierre Armand; and Petroff, Leon, to Profiles et Tubes de l-Est; and Centre de Recherche d'Architecture d'Urbanisme et de Construction Rauc. Building frame. 4,073,113, Cl. 52-710.000.

Overbeek, Gerhardus: *See*—
Pittie, Willem Hubert; and Overbeek, Gerhardus, 4,073,709, Cl. 204-113.000.

Overhead Conveyor Company: *See*—
Harrington, Earl J., 4,073,236, Cl. 104-172.00S.

Owatonna Tool Company: *See*—
McClocklin, Samuel B.; and Solie, James C., 4,073,315, Cl. 137-629.000.

Owczarski, William A.: *See*—
Duvall, David S.; Owczarski, William A.; Paulonis, Daniel F.; and Schaefer, Robert P., 4,073,639, Cl. 75-.50R.

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van den Bosch, Steven, 4,073,957, Cl. 426-535.000.

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Simons, Wayne K., 4,073,199, Cl. 74-473.00R.

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O'Neill, George J.; and Pacifici, James G., 4,073,777, Cl. 260-75.00S.

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Schoppee, Lawrence W., 4,073,123, Cl. 53-234.000.

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Lopez, Manuel; and Sharp, Bernard C., 4,073,461, Cl. 248-475.00R.

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Leyendecker, Helmut, 4,074,164, Cl. 313-25.000.

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Schmid, August, 4,073,379, Cl. 198-796.000.

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Patterson, William Luther, to Adams-Russell Co., Inc. Component carrying. 4,073,381, Cl. 206-331.000.

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Flanigen, Edith Marie; and Patton, Robert Lyle, 4,073,865, Cl. 423-339.000.

Paul, Edward: *See—*
Midler, Michael, Jr.; and Paul, Edward, 4,073,743, Cl. 252-309.000.

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Klein, Edgar; Kracke, Reinhard; Nespital, Walter; and Paul, Rudiger, deceased, 4,073,877, Cl. 423-616.000.

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Duvall, David S.; Owczarski, William A.; Paulonis, Daniel F.; and Schaefer, Robert P., 4,073,639, Cl. 75-.50R.

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Pearson, Ottis D. Magnetic head hammer. 4,073,327, Cl. 145-30.00A.

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Peck, Ralph E.: *See—*
Pircon, Ladislav J.; and Peck, Ralph E., 4,073,634, Cl. 71-37.000.

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Johnson, Duane Edward; and Pederson, Lester Arlyn, 4,074,031, Cl. 526-49.000.

Pegg, Frank Raymond. Garment hanger security device. 4,073,415, Cl. 223-92.000.

Pei, Inc.: *See—*
Baum, Werner, 4,073,351, Cl. 175-14.000.

Pejchal, Karel: *See—*
Carlsson, Eric; Gefvert, Karl Ivan; Hjalmarsson, Thomas; Kerff, Anton; Pejchal, Karel; and Wide, Lars, 4,073,450, Cl. 242-131.000.

Pentney, Harry, to Gillette Company, The. Dispensing container with frangible webs. 4,073,407, Cl. 221-102.000.

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Naarmann, Herbert; Penzien, Klaus; and Gausepohl, Hermann, 4,074,032, Cl. 526-44.000.

Perera, Armand, to Raymond Lee Organization, Inc., The. Attachable pipe tee. 4,073,515, Cl. 285-158.000.

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Ford, Michael Alan, 4,073,198, Cl. 74-360.000.

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Byalko, Mikhail Vladimirovich; Kirko, Elena Viktorovna; Perlovsky, Rafaei Shliomovich; and Ryzhnev, Vadim Jurievich, 4,073,183, Cl. 73-23.000.

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Perrill, Theodore Charles: *See—*
Schiller, Robert J.; and Perrill, Theodore Charles, 4,074,356, Cl. 364-465.000.

Personal Communications, Inc.: *See—*
Yevick, George J., 4,073,650, Cl. 96-46.000.

Pert, Agu: *See—*
Pert, Candace B.; Pert, Agu; and Tallman, John F., 4,073,885, Cl. 424-101.000.

Pert, Candace B.; Pert, Agu; and Tallman, John F., to United States of America, Health, Education and Welfare. Anodynin, an endogenous opiate analgesic from human blood, and process for recovering same. 4,073,885, Cl. 424-101.000.

Peters, Martinus T. J., to Oce-van der Grinten, N.V. Toner powder for electrostatic images comprising epoxy resin. 4,073,739, Cl. 252-62.10P.

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Galkiewicz, Thomas M.; Petersen, Kenneth C.; and Sullivan, John L., 4,073,776, Cl. 260-51.0EP.
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Anhalt, John W.; Goodman, David S.; and Peterson, Carl W., 4,073,560, Cl. 339-99.00R.

Peterson, Marvin A., to General Electric Company. Partially imidized polyamide-acid polymers, aqueous coating compositions, coated wire and method, and partially imidized intermediate. 4,073,788, Cl. 260-29.20N.

Petrenchik, John R., to Mercury Machine Company. Apparatus for molding irregular shapes. 4,073,609, Cl. 425-442.000.

Petroff, Leon: *See—*
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Korshunov, Evgeny Alexeevich; Bainov, Nikolai Ivanovich; Petrov, Igor Nikolaevich; Konovalov, Georgy Fedorovich; Arshansky, Mikhail Iosipovich; Shmidt, Petr Genrikhovich; Kostrov, Valery Pavlovich; and Efremov, Petr Evgenievich, 4,073,333, Cl. 164-66.000.

Pettibone Laboratories, Inc.: *See—*
Snyder, Martin, 4,073,888, Cl. 424-149.000.

Pettingell, Winslow L., to Foam Cutting Engineers, Inc. Method of applying modifying ingredients to open-celled polyurethane material. 4,073,979, Cl. 427-244.000.

Peyman, Gholam A.; and Koziol, Jeffrey E. Artificial intraocular lens attachment. 4,073,015, Cl. 3-13.000.

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Dobner, Reinhold; and Hager, Walter, 4,073,252, Cl. 112-265.000.

Pfefferle, William C.; and Hettinger, William P., Jr., to Engelhard Minerals & Chemicals Corporation. Process for producing synthetic natural gas and high octane motor fuel components. 4,073,716, Cl. 208-66.000.

Pfizer Inc.: *See—*
Brennan, Thomas M., 4,073,780, Cl. 260-112.50R.
Hamanaka, Ernest S.; and Stam, John G., 4,073,783, Cl. 260-239.100.
Hess, Hans-Jurgen E.; and Schaaf, Thomas K., 4,074,044, Cl. 542-402.000.

Phillips, Ian Ross; and Reynolds, Mervyn Frank, to N. J. Phillips Pty. Limited. Nozzle tip. 4,073,293, Cl. 128-223.000.

Phillips Petroleum Company: *See—*
DeLano, Merritt V., Jr., 4,073,630, Cl. 48-197.00R.

Philpot, Marvin J., to Allis-Chalmers Corporation. Spring-loaded clamp for an earth-working tool shank. 4,073,347, Cl. 172-710.000.

Picard, Jean: *See—*
Dore, Alain; Picard, Jean; and Rochereau, Jacques, 4,074,258, Cl. 340-347.00P.

Piccal Subsea Limited: *See—*
Aylmer, Norman Noel; Coe, Peter; Watson, John Graham; and Holloway, Brian Percy, 4,073,157, Cl. 61-111.000.

Pickles, Joseph, to Ferro Manufacturing Corporation. Six-way adjustable seat support. 4,073,459, Cl. 248-394.000.

Pieper, Helmut: *See—*
Keck, Johannes; Puschmann, Sigfrid; Kruger, Gerd; Noll, Klaus-Reinhold; Leitold, Matyas; and Pieper, Helmut, 4,073,942, Cl. 424-330.000.

Pierrel, Michel: *See—*
Fort, Pierre Henri Marie; and Pierrel, Michel, 4,073,335, Cl. 164-154.000.

Pierrel S.p.A.: *See—*
Zumin Tricerri, Silvia; and Chiarani, Lino, 4,073,903, Cl. 424-246.000.

Pigott, Keith: *See—*
Webb, Edward A.; Barakitis, Nikolaos; and Pigott, Keith, 4,074,166, Cl. 313-185.000.

Pilat, Joseph. Appliance cord reel. 4,073,449, Cl. 242-107.100.

Pillsbury Company, The: *See—*
Hansen, Eldon D.; and Edmonson, Douglas A., 4,073,950, Cl. 426-128.000.
Standing, Charles N.; and Olabode, Hamilton A., 4,073,952, Cl. 426-242.000.

Pino, James J.: *See—*
Ueltz, Herbert F. G.; Dashineau, Melvin A.; and Pino, James J., 4,073,096, Cl. 51-309.00A.

Pircon, Ladislav J.; and Peck, Ralph E. Process for production of fertilizers. 4,073,634, Cl. 71-37.000.

Pitcher, Gerald Kennedy: *See—*
Ladell, Joshua; and Pitcher, Gerald Kennedy, 4,074,132, Cl. 250-277.00R.

Pitel, Ira Jay, to GTE Sylvania Incorporated. High power factor AC to DC converter circuit. 4,074,344, Cl. 363-44.000.

Pitney-Bowes, Inc.: *See—*
O'Brien, John G.; and Calderazzo, Franklin J., 4,073,391, Cl. 214-65.000.

Pittie, Willem Hubert; and Overbeek, Gerhardus, to Anglo-Transvaal Consolidated Investment Company Limited. Electrolytic recovery of nickel and zinc. 4,073,709, Cl. 204-113.000.

Pittsburgh Corning Corporation: *See—*
Dudzinski, Stanley J., 4,073,976, Cl. 427-181.000.

Pivovarov, Mikhail Danilovich: *See—*
Kandul, Jury Vasilievich; Semeny, Valery Yakovlevich; Pivovarov, Mikhail Danilovich; Malovik, Vladlen Vasilievich; Mazepa, Ivan Karpovich; and Feschenko, Ninel Gavrilovna, 4,073,809, Cl. 260-606.50P.

Plankl, Leo Hans: *See—*
Nestler, Heinz; and Plankl, Leo Hans, 4,073,972, Cl. 427-136.000.

Plate, John R.; and Lucas, James H., to Allis-Chalmers Corporation. Cable retainer. 4,073,200, Cl. 74-501.00R.

Plate Kofasil Gesellschaft mit beschrankter Haftung: *See—*
Beck, Theodor; and Gross, Friedrich, 4,073,889, Cl. 424-164.000.

Pluim, Arthur William, Jr.: *See—*
Bryan, Thomas Toplica; and Pluim, Arthur William, Jr., 4,073,999, Cl. 428-311.000.

Podany, John P. Power failure alarm. 4,074,245, Cl. 340-248.00B.

Pohl, Ludwig: *See—*
Erdmann, Dietrich; Eidenschink, Rudolf; Krause, Joachim; and Pohl, Ludwig, 4,073,742, Cl. 252-299.000.

Pohl, Siegfried: *See—*
Gernhardt, Paul; Grams, Wolfgang; Danguillier, Wilhelm; and Pohl, Siegfried, 4,073,628, Cl. 48-62.00R.

Poittevin, Andre; and Torelli, Vesperto, to Roussel Uclaf. Hypolipemiant compositions and methods. 4,073,919, Cl. 424-270.000.

Polaroid Corporation: *See—*
Johnson, Bruce K.; and Whiteside, George D., 4,074,288, Cl. 354-33.000.
Kee, Richard C., 4,074,295, Cl. 354-145.000.

Poler, Stanley. Intra-ocular lens. 4,073,014, Cl. 3-13.000.

Polichette, Joseph; Leech, Edward J.; and Branigan, John G., to Kollmorgen Technologies Corporation. Composition for the activation of resinous bodies for adherent metallization. 4,073,740, Cl. 252-156.000.

Pollinger, Hans, to Knorr-Bremse GmbH. Actuating cylinder for a magnetic rail brake unit. 4,073,218, Cl. 92-85.00R.

Polster, Johannes: *See—*
Heid, Christian; and Polster, Johannes, 4,073,616, Cl. 8-34.000.

Polytechnic Institute of New York: *See—*
Okamoto, Yoshiyuki; Wang, Joseph Y.; and Chou, Eng J., 4,073,726, Cl. 210-45.000.

Ponsen, Gijsbert Johannes: *See—*
Wesselink, Gustaaf Adolf; Roelofs, Hendrik; and Ponsen, Gijsbert Johannes, 4,074,172, Cl. 315-307.000.

Pont-A-Mousson S.A.: *See—*
Fort, Pierre Henri Marie; and Pierrel, Michel, 4,073,335, Cl. 164-154.000.

Popovic, Djorde R.: *See—*
Bull, Rame; Denenberg, Byron A.; and Popovic, Djorde R., 4,073,621, Cl. 23-254.00E.

Popper, Karel; Camirand, Wayne M.; Williams, Gerald S.; and Mecchi, Edward P., to United States of America, Agriculture. Regeneration of spent activated carbon with formaldehyde. 4,073,747, Cl. 252-412.000.

Porte, Laurent, to Centre Europeen de Recherches Pharmacologiques C.E.R.P.H.A. Method for treating cardiac arhythmia by administration of basic aryloxyacetamide. 4,073,940, Cl. 424-324.000.

Porter, Glendon Russell: *See—*
Blake, Roy Baxter, Jr.; Gwatkin, James deGoulard, III; Magee, Judy Pat; and Porter, Glendon Russell, 4,074,087, Cl. 179-170.200.

Portnoy, Norman A.; and Anderson, David Paul, to International Telephone and Telegraph Corporation. Recovery of chemical components of cellulosic regenerating solution. 4,073,660, Cl. 106-311.000.

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Jonscher, Charles Maria, 4,074,228, Cl. 340-146.1AQ.
Rollett, John Mortimer, 4,074,215, Cl. 333-80.00R.

Potter, Blaine: *See—*
Flagg, Richard Edward; and Potter, Blaine, 4,073,497, Cl. 279-2.00R.

Powers, Kenneth W.; and Kuntz, Irving, to Exxon Research & Engineering Co. Halomethylated aromatic interpolymers. 4,074,035, Cl. 526-185.000.

Powers Regulator Company: *See—*
Modes, Edward, 4,073,433, Cl. 236-49.000.

Powers, Robert W., to General Electric Company. Method of producing lithiated beta-alumina articles. 4,073,711, Cl. 204-181.00F.

PPG Industries, Inc.: *See—*
Bartrug, Norman G.; and McDaniel, Donald L., 4,073,849, Cl. 264-236.000.
Keslar, Leroy D.; and Vensel, James E., 4,073,986, Cl. 428-38.000.

Prager, Jay, to Centronics Data Computer Corporation. Apparatus and circuits for two-color printing in electronic impact printers. 4,073,371, Cl. 197-157.000.

Pratt & Lambert: *See—*
Wolinski, Leon E.; Riebling, Richard G.; and Edholm, John H., 4,074,033, Cl. 526-47.000.

Prell, Edward Myron; and Rogers, Barry William, to Bell Telephone Laboratories, Incorporated. Coin telephone antifraud system. 4,074,079, Cl. 179-6.30R.

Pressley, Paul E. Vehicle towing apparatus. 4,073,506, Cl. 280-402.000.

Preus, Paul. Barrier for water carried pollutants. 4,073,143, Cl. 61-1.00F.

Prey, Gerhard, to Siemens Aktiengesellschaft. Method for monitoring the sequential order of successive code signal groups. 4,074,229, Cl. 340-146.1AG.

Price, Stephen Glenn: *See—*
Vian, David Roy; and Price, Stephen Glenn, 4,073,512, Cl. 285-12.000.

Prichard, Daniel R.: *See—*
Stoessel, Herman V.; and Prichard, Daniel R., 4,073,377, Cl. 198-624.000.

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Bedenk, William Thomas; and Sagel, Paul Joseph, 4,073,996, Cl. 428-274.000.
Laughlin, Robert Gene, 4,073,833, Cl. 264-4.000.

Profiles et Tubes de l-Est: *See—*
Oudot, Pierre Armand; and Petroff, Leon, 4,073,113, Cl. 52-710.000.

Prolizenz AG.: *See—*
Schmidt, Walter; and Stahlin, Walter, 4,073,355, Cl. 177-83.000.

Propper Manufacturing Co., Inc.: *See—*
Speelman, Irving A.; and Raczkowski, Jan, 4,073,314, Cl. 137-625.470.

Protzl, Martin, to Didier Engineering GmbH. Impact absorbing attachment for riser cover. 4,073,697, Cl. 202-254.000.

Pryanikov, Evgeny Ivanovich: *See—*
Aliev, Vagab Safarovich; Markarian, Georgy Georgievich; Rustamov, Musa Ismail ogly; Pryanikov, Evgeny Ivanovich; Ismailova, Rustam Gadzhi Ali ogly, deceased; Ismailov, Amina Kyazim Kyzy, administrator; Ismailova, Ali Rustam ogly, administrator; Ismailova, Dzhulietta Rustamovna, administrator; and Kulieva, Zhanna Rustamovna, administrator, 4,073,717, Cl. 208-74.000.

Pullen, Albert, to Hazemeijer B.V. Electric arc extinction apparatus. 4,074,098, Cl. 200-144.00R.

Purolator, Inc.: *See—*
Lauer, William; and Mouwen, Herman Charles, 4,073,732, Cl. 210-491.000.

Puschmann, Sigfrid: *See—*
Keck, Johannes; Puschmann, Sigfrid; Kruger, Gerd; Noll, Klaus-Reinhold; Leitold, Matyas; and Pieper, Helmut, 4,073,942, Cl. 424-330.000.

Pustka, Karel: *See—*
Weber, Klaus; Ludemann, Heinz; Schubert, Andreas; and Pustka, Karel, 4,073,118, Cl. 53-23.000.

Quaker Oats Company, The: *See—*
Chandler, Keith L.; Hyldon, Roy G.; Kumar, Surinder; and O'Mahony, John P., 4,073,948, Cl. 426-44.000.

Qualitrol Corporation: *See—*
Romanowski, Robert F., 4,074,095, Cl. 200-81.90M.
Romanowski, Robert F., 4,074,096, Cl. 200-83.00D.

Quarton, William T., to Honeywell Inc. Method and appartus for making hard copy records of curves including curves which are mathematically described as multi-functions from periodically sampled data points. 4,074,281, Cl. 346-110.00R.

Quelet, Jean Raymond, to Laboratoire le Brun S.A. 8-Amino-theophylline derivatives and applications thereof. 4,073,908, Cl. 424-253.000.

Quinn, Clayton B., to General Electric Company. Preparation of dichloroethylene polymers. 4,073,774, Cl. 260-47.0UA.

Quinn, Clayton B.: *See—*
Kinson, Philip L.; and Quinn, Clayton B., 4,073,814, Cl. 260-619.00A.

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Allred, James Kenneth; Liddell, Arlyn G.; Quinn, Edward Barney; and Black, Francis Bischoff, 4,074,120, Cl. 235-419.000.

Quinn, Edwin J.: *See—*
Dieck, Ronald L.; and Quinn, Edwin J., 4,073,824, Cl. 260-823.000.
Dieck, Ronald L.; and Quinn, Edwin J., 4,073,825, Cl. 260-824.00R.

Raabe, Paul J.; and Tarbell, Harlan E., to Grefco, Inc. Process for producing an expansion joint cover. 4,073,673, Cl. 156-244.000.

Rabin, Harry H.; and Aquino, Florencio P., to Miami Footwear Corporation. Ladies shoe construction. 4,073,074, Cl. 36-104.000.

Racciato, Joseph S.: *See—*
Lindroth, Thomas A.; and Racciato, Joseph S., 4,073,653, Cl. 106-26.000.

Raczkowski, Jan: *See—*
Speelman, Irving A.; and Raczkowski, Jan, 4,073,314, Cl. 137-625.470.

Raduechel, Bernd: *See—*
Skuballa, Werner; Raduechel, Bernd; Vorbrueggen, Helmut; Elger, Walter; Loge, Olaf; and Schillinger, Eckehard, 4,073,934, Cl. 424-305.000.

Ralphs, George Trevor: *See—*
Bailey, Frank Gordon; and Ralphs, George Trevor, 4,073,022, Cl. 12-135.00A.

Ralston Purina Company: *See—*
Spata, James M.; and Diel, Roger L., 4,073,962, Cl. 426-646.000.

Ramachandran, Pallassana, to Colgate Palmolive Company. Rinse cycle fabric softener. 4,073,735, Cl. 252-8.800.

Ramirez, Noemi Bernardo: *See—*
Eliades, Theo Ioannou; and Ramirez, Noemi Bernardo, 4,073,744, Cl. 252-389.00R.

Ramp, Floyd Lester, to B. F. Goodrich Company, The. High normality ion exchange membranes containing entrapped electrostatically bulky multicharged ions and method of production. 4,073,752, Cl. 260-2.10R.

Ramsdell, Steven C.: *See—*
Woods, William E.; Stanley, Philip E.; Izbicki, Kenneth J.; and Ramsdell, Steven C., 4,074,353, Cl. 364-200.000.

Ramsden, Frederick G. Shock absorber installation tool. 4,073,046, Cl. 29-401.00R.

Ramuz, Henri, to Hoffmann-La Roche Inc. Sulphur containing derivatives. 4,073,797, Cl. 260-327.00M.

Rank Xerox Ltd.: *See—*
Kobayashi, Tatsuo; and Miyazaki, Akira, 4,073,585, Cl. 355-14.000.
Selwyn, Michael Frederick James, 4,073,587, Cl. 355-3.0CH.

Rauch, John E.: *See—*
Orlandi, John F.; and Rauch, John E., 4,073,127, Cl. 57-58.360.

Rauch, Stewart E.: *See—*
Steinbicker, Richard N.; and Rauch, Stewart E., 4,073,701, Cl. 204-54.00R.

Rayburn, Herbert F. Viewer for a strip of film. 4,073,581, Cl. 352-129.000.

Raychem Corporation: *See—*
Nyberg, David Dolph, 4,073,830, Cl. 260-860.000.
Raymond, Douglas D.: *See—*
Seguin, Ronald D.; and Raymond, Douglas D., 4,073,154, Cl. 61-86.000.
Raymond, Eugene B. Spark plug terminal. 4,073,565, Cl. 339-223.00S.
Raymond Lee Organization, Inc., The: *See—*
Jansen, Bernard L., 4,074,078, Cl. 179-84.00C.
Jorgensen, Allen C., 4,073,211, Cl. 84-291.000.
Moss, Margurita L., 4,074,107, Cl. 219-212.000.
Perera, Armand, 4,073,515, Cl. 285-158.000.
Sepaniac, Walter J., 4,073,491, Cl. 273-29.00B.
Tierney, Timothy P., 4,073,522, Cl. 292-262.000.
RCA Corporation: *See—*
Crowle, Brian, 4,074,181, Cl. 323-8.000.
Dischert, Robert Adams; Hurst, Robert Norman; and Luther, Arch Clinton, Jr., 4,074,307, Cl. 358-8.000.
Gibson, Walter Gold, 4,074,308, Cl. 358-38.000.
Lysobey, Morris, 4,074,209, Cl. 332-19.000.
Pankove, Jacques Isaac, 4,074,139, Cl. 250-492.00A.
Reisner, John Henry; Morewood, William Henry; and Riddle, George Herbert Needham, 4,074,313, Cl. 358-128.000.
Robe, Thomas Joseph, 4,074,205, Cl. 330-257.000.
Reber, Harald, to Robert Bosch GmbH. Catalyst containing closure plug for storage battery and method of operating storage battery. 4,074,024, Cl. 429-86.000.
Redlich, Wayne: *See—*
Caputo, Salvatore; Fitch, Scott McDowell; Harris, Cliff Andrew; Kuhar, John, Jr.; Pappas, Andrew Leo; and Redlich, Wayne, 4,074,358, Cl. 364-514.000.
Reed, Robert T., to Walton Products, Inc. Car coupler. 4,073,385, Cl. 213-100.00R.
Regel, Erik; Eue, Ludwig; and Schmidt, Robert R., to Bayer Aktiengesellschaft. Azolylamidine compounds and herbicidal compositions. 4,073,636, Cl. 71-92.000.
Regie Nationale des Usines Renault: *See—*
Dutartre, Maurice; and Roger, Yves, 4,073,178, Cl. 72-352.000.
Regnaut, Bernard, to Societe Generale de Constructions Electriques et Mecaniques "Alsthom et Cie". Cross-feed fuel cell battery with filter press type structure of polygonal cross-section. 4,074,020, Cl. 429-34.000.
Reh, Lothar: *See—*
Collin, Per Harald; Flink, Sune Natanael; Widell, Bjorn; Hirsch, Martin; and Reh, Lothar, 4,073,642, Cl. 75-35.000.
Reigel, Franklin G.: *See—*
Benda, David; and Reigel, Franklin G., 4,073,558, Cl. 316-18.000.
Reinauer, Thomas V.; Duyckinck, Robert W.; and Handwork, Frank B., to United States Filter Corporation. Filter bag assembly. 4,073,632, Cl. 55-374.000.
Reisner, John Henry; Morewood, William Henry; and Riddle, George Herbert Needham, to RCA Corporation. Electron beam disc recorder. 4,074,313, Cl. 358-128.000.
Resch, Reinhard, to Daimler-Benz Aktiengesellschaft. Switching device for the indirect alteration of the mechanical brake pedal transmission. 4,073,543, Cl. 303-10.000.
Research Corporation: *See—*
Watanabe, Kyoichi Aloisius; Chu, Chung Kwang; and Fox, Jack Jay, 4,074,042, Cl. 536-1.000.
Resistoflex Corporation: *See—*
Chu, Edward J., 4,073,856, Cl. 264-259.000.
Reufer, Christian, to Viscosuisse SA. Apparatus for picking up rapidly running filaments. 4,073,421, Cl. 226-97.000.
Reynolds, James W.: *See—*
Whisman, Marvin L.; Reynolds, James W.; Goetzinger, John W.; and Cotton, Faye O., 4,073,719, Cl. 208-180.000.
Reynolds, Mervyn Frank: *See—*
Phillips, Ian Ross; and Reynolds, Mervyn Frank, 4,073,293, Cl. 128-223.000.
Rheude, Alfred: *See—*
Muller, Jurgen; Rheude, Alfred; and Schmidt, Manfred, 4,074,133, Cl. 250-315.00A.
Rhone-Poulenc Industries: *See—*
Cordier, Georges, 4,073,813, Cl. 260-617.00C.
Rhone-Poulenc, S.A.: *See—*
Chapurlat, Robert, 4,073,724, Cl. 210-23.00H.
Ric-Wil, Incorporated: *See—*
Croft, John C., 4,074,363, Cl. 366-138.000.
Richards, David O.; Jones, Isaac P.; Duffee, Homer W.; and Nutter, Charles E., to Owens-Corning Fiberglas Corporation. Composite panel. 4,073,997, Cl. 428-285.000.
Richardson-Merrell, Inc.: *See—*
Fleming, Robert W.; Sill, Arthur D.; and Sweet, Francis W., 4,073,904, Cl. 424-248.580.
Grunwell, Joyce F.; and Johnston, John O., 4,073,899, Cl. 424-238.000.
Richter, Friedrich: *See—*
Muller, Kurt; Richter, Friedrich; and Schramm, Heinz-Helmut, 4,074,064, Cl. 174-28.000.
Richter, Gabriele, nee Redomske. Gift-dispensing device. 4,073,405, Cl. 221-89.000.
Richter, Volker: *See—*
Scheffel, Dieter; and Richter, Volker, 4,073,262, Cl. 118-52.000.
Ricoh Company, Ltd.: *See—*
Imai, Kiyoshi; Hasebe, Nobuyuki; Asami, Tomiaki; Soga, Setsuo; Fukushima, Ichiro; and Asahina, Yasuo, 4,074,001, Cl. 428-329.000.
Yanagawa, Nobuyuki, 4,074,217, Cl. 355-30.000.
Riddle, George Herbert Needham: *See—*
Reisner, John Henry; Morewood, William Henry; and Riddle, George Herbert Needham, 4,074,313, Cl. 358-128.000.
Riebling, Richard G.: *See—*
Wolinski, Leon E.; Riebling, Richard G.; and Edholm, John H., 4,074,033, Cl. 526-47.000.
Rihm, Herbert; and Rogge, Walter, to Honeywell G.m.b.H. Rotary valve. 4,073,473, Cl. 251-298.000.
Riley, John A., to Westinghouse Electric Corporation. Power supply protective circuit. 4,074,346, Cl. 363-50.000.
Rinsler, Samuel J.: *See—*
Weck, Friedrich J.; Hunkins, James; and Rinsler, Samuel J., 4,073,982, Cl. 427-270.000.
Risdon Manufacturing Company, The: *See—*
Schultz, Robert S., 4,073,398, Cl. 215-253.000.
Rist, Bruno A.: *See—*
Tanner, James L.; and Rist, Bruno A., 4,074,311, Cl. 358-118.000.
Ritch, Donald: *See—*
Tarrson, Emanuel B.; Tisma, Steven; and Ritch, Donald, 4,073,419, Cl. 225-44.000.
Ritter, Fridolin J., to Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek Ten Behoeve Van Nijverheid Handel en Verkeer. 5-Methyl-3-M-butyl-octahydroindolizine as an attractant for ants. 4,073,882, Cl. 424-84.000.
Rizzo, John. Prismatic stereoscopic viewer. 4,073,569, Cl. 350-137.000.
RKL Controls, Inc.: *See—*
Little, Robert K.; and Lincoln, Edgar Barry, 4,073,467, Cl. 251-7.000.
Ro-Search, Inc.: *See—*
Liebscher, Anton; Oberg, Sven; Smathers, Kenneth; and Auberry, Horace, 4,073,023, Cl. 12-142.0RS.
Roadways International Corporation: *See—*
Lowry, James M.; and Azar, David, 4,073,759, Cl. 260-28.5AS.
Roalson, Howard John, to International Business Machines Corporation. Operating point regulation for a corona discharge device. 4,074,134, Cl. 250-324.000.
Robbins, James A.: *See—*
Angarola, Barry R.; and Robbins, James A., 4,073,389, Cl. 214-10.50D.
Robbins, William E.: *See—*
Thompson, Malcolm J.; Feldmesser, Julius; and Robbins, William E., 4,073,939, Cl. 424-320.000.
Robe, Thomas Joseph, to RCA Corporation. Input stage for fast-slewing amplifier. 4,074,205, Cl. 330-257.000.
Robert A. Casalou, Inc.: *See—*
Casalou, Robert A., 4,074,125, Cl. 362-271.000.
Robert Bosch GmbH: *See—*
Eheim, Franz, 4,073,277, Cl. 123-139.0BD.
Herth, Harro; Kraus, Bernd; Sautter, Wilfried; and Wessel, Wolf, 4,073,269, Cl. 123-32.0EE.
Hofer, Gerald; and Konrath, Karl, 4,073,275, Cl. 123-139.0AF.
Reber, Harald, 4,074,024, Cl. 429-86.000.
Schramm, Heribert; and Wuensch, Steffen, 4,073,348, Cl. 173-48.000.
Wurst, Bert; and Vogt, Harald, 4,073,203, Cl. 74-866.000.
Roberts, Richard, to United Technologies Corporation. Convectively cooled flameholder for premixed burner. 4,073,137, Cl. 60-39.320.
Roberts, Richard W.: *See—*
Abendschein, Frederic Henry; Ivey, John Saxon; Roberts, Richard W.; and Tothero, Dwight L., 4,073,603, Cl. 417-222.000.
Robertson, John A., to Mead Corporation, The. Compensation circuit for channel to channel crosstalk. 4,074,278, Cl. 346-75.000.
Robin, Gary I.: *See—*
Bogen, John S.; and Robin, Gary I., 4,074,243, Cl. 340-237.00R.
Robison, Russell O. Dynamo-electric machine. 4,074,159, Cl. 310-154.000.
Robud Co.: *See—*
Kirkpatrick, Alan D., 4,073,207, Cl. 83-659.000.
Kirkpatrick, Alan D., 4,073,208, Cl. 83-659.000.
Roch, Gerald V.; and Wiles, James P., to Hurco Manufacturing Company Inc. Soft-wired machine tool control. 4,074,350, Cl. 364-107.000.
Rochereau, Jacques: *See—*
Dore, Alain; Picard, Jean; and Rochereau, Jacques, 4,074,258, Cl. 340-347.00P.
Rockwell-Rimoldi, S.p.A.: *See—*
Marforio, Nerino, 4,073,248, Cl. 112-207.000.
Rodler, Waldo E., Jr., to Turbo Engineering Corporation. Marine propulsion system. 4,073,257, Cl. 115-12.00R.
Roe, Edward A.; and Schulte, Harold F. Centrifugal casting machine. 4,073,336, Cl. 164-286.000.
Roebke, Wolfgang; Kneitel, Dieter; and Parr, Erfried, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler; and Henkel u. Cie GmbH. Process for the production of crystalline zeolitic molecular sieves of type A. 4,073,867, Cl. 423-429.000.
Roed, Finn, to Norsk Hydro a.s. Means for cooling of self-baking anodes in aluminum electrolysis cells. 4,073,714, Cl. 204-243.00R.
Roelofs, Hendrik: *See—*
Wesselink, Gustaaf Adolf; Roelofs, Hendrik; and Ponsen, Gijsbert Johannes, 4,074,172, Cl. 315-307.000.
Roger Pelleray: *See—*
Nee, Paul, 4,074,106, Cl. 219-137.00R.
Roger, Yves: *See—*
Dutartre, Maurice; and Roger, Yves, 4,073,178, Cl. 72-352.000.

Rogers, Barry William: *See—*
Prell, Edward Myron; and Rogers, Barry William, 4,074,079, Cl. 179-6.30R.
Rogers, David M.: *See—*
Foxton, Michael W.; Gregory, Gordon I.; and Rogers, David M., 4,074,047, Cl. 544-30.000.
Rogers, William Oakley: *See—*
Davis, Earl Klimer; Rogers, William Oakley; and Silvis, Duane Charles, 4,073,657, Cl. 106-73.500.
Rogge, Walter: *See—*
Rihm, Herbert; and Rogge, Walter, 4,073,473, Cl. 251-298.000.
Rohde, Heino J.: *See—*
Rowley, David S.; Walker, Bruce H.; Fielder, Coy M.; and Rohde, Heino J., 4,073,354, Cl. 175-329.000.
Rohloff, Fritz: *See—*
Heinzelmann, Max; Rohloff, Fritz; and Schuren, Hans, 4,074,136, Cl. 250-392.000.
Rohm and Haas Company: *See—*
Lint, Robert F., 4,073,049, Cl. 29-458.000.
Miller, George A.; Chan, Hak-Foon; and Carley, Harold E., 4,073,921, Cl. 424-273.00R.
Rokos, George Hedley Storm, to Xerox Corporation. Optoelectronic device with optical feedback. 4,074,143, Cl. 250-552.000.
Rollett, John Mortimer, to Post Office. Stable gyrator network for simularity inductance. 4,074,215, Cl. 333-80.00R.
Rolls-Royce (1971) Limited: *See—*
Symon, Roger James, 4,073,136, Cl. 60-39.28R.
Romanowski, Robert F., to Qualitrol Corporation. Flow operable switch device. 4,074,095, Cl. 200-81.90M.
Romanowski, Robert F., to Qualitrol Corporation. Bellows controlled sudden pressure rise relay. 4,074,096, Cl. 200-83.00D.
Romell, Gunnar Vigg Riss: *See—*
Eklof, Ake Torsten; Fengsborn, Per Tage Allan; and Romell, Gunnar Vigg Riss, 4,073,350, Cl. 173-139.000.
Ronnebaum, Morris L.: *See—*
Groth, Roger L.; Harvey, Randall L.; Lauer, Thomas R.; and Ronnebaum, Morris L., 4,073,346, Cl. 172-439.000.
Roos, Ernst: *See—*
Buysch, Hans-Josef; Oertel, Harald; and Roos, Ernst, 4,073,746, Cl. 252-404.000.
Rorrer, Robert J.: *See—*
Spence, Junior C.; Rorrer, Robert J.; and Holt, James L., 4,073,320, Cl. 139-383.00R.
Rosen, Perry: *See—*
Kienzle, Frank; and Rosen, Perry, 4,074,045, Cl. 542-426.000.
Rosenkranz, Hans Jurgen: *See—*
Hemmerich, Heinz-Peter; Winter, Gerhard; Rosenkranz, Hans Jurgen; and Woditsch, Peter, 4,073,764, Cl. 260-37.00N.
Roser, Gerhard K., to Weber Marking Systems, Inc. Selective label printer. 4,073,231, Cl. 101-48.000.
Ross, Svante Bertil: *See—*
Lindberg, Ulf Henrik Anders; Ross, Svante Bertil; Thorberg, Seth Olov; and Ogren, Sven Ove, 4,073,941, Cl. 424-324.000.
Rossini, Alfred P. Lightweight anchor having high strength to weight ratio. 4,073,256, Cl. 114-306.000.
Rothmans of Pall Mall Canada Limited: *See—*
Brackmann, Warren A.; and DiIanni, Daniel, 4,073,850, Cl. 264-93.000.
Rousseau, Paul E., to "Applications de la Chimle, de l'Electricite et des Metaux" en abrege:"SADACEM". Curtain wall structure. 4,073,107, Cl. 52-235.000.
Roussel Uclaf: *See—*
Poittevin, Andre; and Torelli, Vesperto, 4,073,919, Cl. 424-270.000.
Rovig, Allen D.: *See—*
Kuhn, Martin C.; Stephens, John A.; Noakes, Michael J.; and Rovig, Allen D., 4,073,479, Cl. 266-173.000.
Rowe, Edward A., Jr.; and Cawley, William H., to Diamond Shamrock Corporation. Methylene chloride phosphatizing. 4,073,066, Cl. 34-73.000.
Rowley, David S.; Walker, Bruce H.; Fielder, Coy M.; and Rohde, Heino J., to Christensen, Inc. Earth-boring drill bits. 4,073,354, Cl. 175-329.000.
Royce, John H., to Traverse City Iron Works. Valve for fire hydrants. 4,073,307, Cl. 137-283.000.
Royce, Peter. Advancement of stuck phonograph needles. 4,073,495, Cl. 274-1.00R.
Ruben, Samuel. Rechargeable voltaic cell with lead mercury amalgam anode and lead peroxide cathode. 4,074,029, Cl. 429-198.000.
Ruben, Samuel. Process for producing nickel oxide cathodic reactant for primary cells. 4,074,030, Cl. 429-223.000.
Rudzki, Eugene M.: *See—*
Wieland, George E., Jr.; and Rudzki, Eugene M., 4,073,668, Cl. 148-113.000.
Rummer, Jurgen. Device for displaying carpet patterns or the like. 4,073,383, Cl. 211-1.500.
Rundkvist, Konstantin Alexandrovich; Ivanov, Nikolai Alexeevich; Ivanov, Boris Gavrilovich; Zarogatsky, Leonid Petrovich; Mitrofanov, Evgeny Sergeevich; and Blekhman, Ilya Izrailevich. Inertia cone crusher. 4,073,446, Cl. 241-207.000.
Runft, Arthur J., to Kelley Co., Inc. Switch assembly having movable contact face configuration for penetrating frost or ice layer on adjacent contact surface. 4,074,112, Cl. 200-279.000.
Rupilius, Wolfgang: *See—*
Koch, Karlheinz; Kolaczinski, Gerhard; Rupilius, Wolfgang; and Stein, Werner, 4,074,013, Cl. 428-457.000.
Russell, James T., to Jacobs, Eli S. Multiple beam optical record playback apparatus for simultaneous scan of plural data tracks. 4,074,085, Cl. 179-100.30B.
Rustamov, Musa Ismail ogly: *See—*
Aliev, Vagab Safarovich; Markarian, Georgy Georgievich; Rustamov, Musa Ismail ogly; Pryanikov, Evgeny Ivanovich; Ismailova, Rustam Gadzhi Ali ogly, deceased; Ismailov, Amina Kyazim Kyzy, administrator; Ismailova, Ali Rustam ogly, administrator; Ismailova, Dzhulietta Rustamovna, administrator; and Kulieva, Zhanna Rustamovna, administrator, 4,073,717, Cl. 208-74.000.
Rutz, Hansruedi: *See—*
Haditsch, Werner; Rutz, Hansruedi; and Toplak, Ernst, 4,074,155, Cl. 310-59.000.
Ruyle, William V.: *See—*
Fisher, Michael H.; and Ruyle, William V., 4,073,791, Cl. 260-294.80R.
Ryan, John W.: *See—*
Beny, Janos; Ryan, John W.; and Snyder, Edward, III, 4,073,088, Cl. 46-265.000.
Ryzhnev, Vadim Jurievich: *See—*
Byalko, Mikhail Vladimirovich; Kirko, Elena Viktorovna; Perlovsky, Rafael Shliomovich; and Ryzhnev, Vadim Jurievich, 4,073,183, Cl. 73-23.000.
S.I.R.I. Societa' Italiana Ricerche Industriali S.p.A.: *See—*
Passariello, Attilio, 4,073,749, Cl. 252-455.00R.
S & S Corporation: *See—*
Clonch, David, 4,073,445, Cl. 241-101.700.
Saft-Societe des Accumulateurs Fixes et de Traction: *See—*
Nadal, Guy, 4,074,022, Cl. 429-54.000.
Sagel, Paul Joseph: *See—*
Bedenk, William Thomas; and Sagel, Paul Joseph, 4,073,996, Cl. 428-274.000.
Sahlin International Inc.: *See—*
Cagle, Harlan R., 4,073,602, Cl. 417-185.000.
Saidla, Glen E. W., to Exxon Research & Engineering Co. Method for forming a fiber reinforced foam article. 4,073,840, Cl. 264-45.300.
Saigusa, Tokuji, to Yokogawa Electric Works, Ltd. Differential pressure transducer. 4,073,191, Cl. 73-706.000.
Saito, Kazuaki: *See—*
Doi, Tsunesuke; Komoto, Hiroshi; Chono, Masazumi; Inoue, Akira; Saito, Kazuaki; and Shinozuka, Isao, 4,073,618, Cl. 21-2.70R.
Saito, Masaaki, to Nissan Motor Company, Limited. Air-fuel metering system for internal combustion engine and apparatus to control air fuel ratio of air-fuel being applied to engine. 4,073,274, Cl. 123-119.00R.
Sajfert, Drago, to Volkswagenwerk Aktiengesellschaft. Lock arrangement for a motor vehicle door. 4,073,526, Cl. 292-347.000.
Saji, Yasuo; Kurioka, Hideo; Tanaka, Kozo; and Ogawa, Hiroyasu, to Toho Beslon Co., Ltd. Process for producing carbon fibers. 4,073,870, Cl. 423-447.600.
Sakaguchi, Akira: *See—*
Murota, Kozo; Matsumoto, Rempei; Yasuma, Toru; Morinaga, Mamoru; Tajima, Shigeo; Nakamura, Masayuki; and Sakaguchi, Akira, 4,073,361, Cl. 181-228.000.
Sakaguchi, Shokichi: *See—*
Kiyokawa, Shin; Sakaguchi, Shokichi; and Takeuchi, Toru, 4,074,222, Cl. 338-212.000.
Sakai, Tetsushi; Sakakibara, Yutaka; Murota, Junichi; and Wada, Tsutomu, to Nippon Telegraph and Telephone Public Corporation. Insulated gate type field effect transistors. 4,074,300, Cl. 357-23.000.
Sakai, Yoshiaki; and Murayama, Kuniki, to Teac Corporation. System for sensing the peaks of an output from a magnetic head. 4,074,325, Cl. 360-39.000.
Sakakibara, Yutaka: *See—*
Sakai, Tetsushi; Sakakibara, Yutaka; Murota, Junichi; and Wada, Tsutomu, 4,074,300, Cl. 357-23.000.
Sakuma, Kotoku, to American Electronics, Inc. Adjustable antenna holding device. 4,074,271, Cl. 343-882.000.
Sakumoto, Hideki; and Namoto, Yoshiteru, to Matsushita Electric Industrial Co., Ltd. Rotary head type magnetic recording and reproducing system. 4,074,329, Cl. 360-85.000.
Salomon, Mordechai: *See—*
Grosinger, Matityahu; and Salomon, Mordechai, 4,073,195, Cl. 74-25.000.
Salvati, John G.; and Skalka, Paul, to Westinghouse Electric Corporation. Circuit breaker. 4,074,218, Cl. 335-176.000.
Salzmann, Theodor; Timpe, Wolfgang; and Weibelzahl, Manfred, to Siemens Aktiengesellschaft. Circuit arrangement with a number of cycloconverters, particularly direct cycloconverters in Y-connection. 4,074,348, Cl. 363-160.000.
Sandberg, Rune Verner; and Akerman, Sven Bengt Arvid, to Astra Lakemedel Aktiebolag. Local anesthetics tertiary aminoalkoxyphenyl ethers. 4,073,917, Cl. 424-267.000.
Sanders, James F., to Minnesota Mining and Manufacturing Company. Driographic master. 4,074,009, Cl. 428-421.000.
Sanders, Rudolf: *See—*
Jagers, Henricus P.; and Sanders, Rudolf, 4,074,121, Cl. 362-13.000.
Sanders, Vernard W.: *See—*
Curry, Edward G.; and Sanders, Vernard W., 4,073,037, Cl. 16-169.000.
Curry, Edward G.; and Sanders, Vernard W., 4,073,038, Cl. 16-189.000.
Sandgrabber, Inc.: *See—*
Fair, Samuel S., 4,073,145, Cl. 61-4.000.

Sandoz, Inc.: *See*—
Galantay, Eugene E.; and Kathawala, Faizulla G., 4,073,936, Cl. 424-308.000.
Sandoz Ltd.: *See*—
Kopp, Klaus F., 4,073,297, Cl. 128-214.400.
Martin, Ulrich, 4,073,915, Cl. 424-267.000.
Troxler, Franz; and Wiskott, Erik, 4,073,909, Cl. 424-258.000.
Sandvig, Timothy C., to Minnesota Mining and Manufacturing Company. Method for rendering substrates resistant to abrasion. 4,073,967, Cl. 427-44.000.
Sangamo Electric Company: *See*—
Hart, David Gerald, 4,074,192, Cl. 324-103.00R.
Sangamo Weston, Inc.: *See*—
Munt, Irwin, 4,074,255, Cl. 340-336.000.
Sankyo Kogaku Kogyo Kabushiki Kaisha: *See*—
Kawatsu, Toshitatsu, 4,073,580, Cl. 352-91.00C.
San Miguel, Anthony, to United States of America, Navy. Composite dome. 4,073,985, Cl. 428-35.000.
Santi, Rinaldo: *See*—
Spaziante, Placido Maria; Santi, Rinaldo; and De Nora, Vittorio, 4,073,707, Cl. 204-105.00R.
Santilli, James N., to Westinghouse Electric Corporation. Fuse structure having improved granular filler material. 4,074,220, Cl. 337-276.000.
Sanyo Electric Co., Ltd.: *See*—
Mizutani, Taketomo; Yasunori, Takaharu; and Yoshimi, Kazuyoshi, 4,073,598, Cl. 416-5.000.
Saraie, Takahiro: *See*—
Kawamatsu, Yutaka; Saraie, Takahiro; Imamiya, Eiko; and Hamuro, Yukihiko, 4,074,057, Cl. 560-55.000.
Sargeant, Ralph G. Agglomeration method. 4,073,951, Cl. 426-237.000.
Sasaguri, Kiichiro: *See*—
Matsuo, Shunji; Sasaguri, Kiichiro; Nakamura, Katsuyuki; Matsumoto, Yoshio; and Sato, Mikio, 4,073,775, Cl. 260-47.0EP.
Sato, Masaaki, to Olympus Optical Co., Ltd. Tape cassette. 4,073,451, Cl. 242-191.000.
Sato, Masanobu; and Kondo, Shiro, to Olympus Optical Co., Ltd. Coupling device between tape recorder and attachment. 4,074,082, Cl. 179-100.110.
Sato, Mikio: *See*—
Matsuo, Shunji; Sasaguri, Kiichiro; Nakamura, Katsuyuki; Matsumoto, Yoshio; and Sato, Mikio, 4,073,775, Cl. 260-47.0EP.
Sato, Setsuo: *See*—
Fujita, Hisaya; Kaieda, Nobuo; Sato, Setsuo; and Kawakami, Kenji, 4,074,274, Cl. 346-34.000.
Sato, Takashi, to Hitachi, Ltd. Address buffer circuit in semiconductor memory. 4,074,148, Cl. 307-279.000.
Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Printing machine for label strip, or the like. 4,073,234, Cl. 101-288.000.
Sauber, Charles J. Outrigger pad. 4,073,454, Cl. 248-188.200.
Sautter, Wilfried: *See*—
Herth, Harro; Kraus, Bernd; Sautter, Wilfried; and Wessel, Wolf, 4,073,269, Cl. 123-32.0EE.
Sawayama, Shigeru: *See*—
Nishikaji, Takashi; Watanabe, Kenzo; and Sawayama, Shigeru, 4,074,041, Cl. 528-488.000.
Scartazzini, Riccardo; and Bickel, Hans, to Ciba-Geigy Corporation. O-Substituted 7β-amino-3-cephem-3-ol-4-carboxylic acid compounds. 4,073,902, Cl. 424-246.000.
Schaaf, Thomas K.: *See*—
Hess, Hans-Jurgen E.; and Schaaf, Thomas K., 4,074,044, Cl. 542-402.000.
Schaefer, Dieter: *See*—
Hack, Joachim; Schaefer, Dieter; and Motz, Herbert, 4,074,002, Cl. 428-331.000.
Schaefer, Robert P.: *See*—
Duvall, David S.; Owczarski, William A.; Paulonis, Daniel F.; and Schaefer, Robert P., 4,073,639, Cl. 75-.50R.
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Hartwig, Peter Rudolf, 4,073,408, Cl. 222-145.000.
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Eisert, Manfred; and Schmeidl, Karl, 4,074,060, Cl. 560-149.000.
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Dultgen, Gerd; and Schmidt, Wolfgang, 4,073,841, Cl. 264-46.600.
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Hall, John B.; Sprecker, Mark A.; Schmitt, Frederick Louis; and Vock, Manfred Hugo, 4,073,751, Cl. 252-522.000.
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Baumgartner, Werner; and Schnoeller, Manfred, 4,073,859, Cl. 264-322.000.
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Laufbahn, Jennie, 4,073,295, Cl. 128-295.000.
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Pahnke, Hans J.; and Schubert, Hans-Albert, 4,073,180, Cl. 72-453.010.
Schulte, Harold F.: *See—*
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Heinzelmann, Max; Rohloff, Fritz; and Schuren, Hans, 4,074,136, Cl. 250-392.000.
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Barnickel, Heinrich; Sigl, Winfrid; and Schwable, Jorg, 4,073,838, Cl. 264-37.000.
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Arneth, Reinhold; and Schwandt, Rudi, 4,073,266, Cl. 118-647.000.
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Batcho, Andrew David; Hengartner, Urs Oskar; Leimgruber, Willy; Scott, John William; and Valentine, Donald, Jr., 4,073,795, Cl. 260-326.14T.
Scott Paper Company: *See—*
Focht, Bruce E., 4,073,991, Cl. 428-138.000.
Scott, Robert G.: *See—*
Huston, John L.; Scott, Robert G.; and Studier, Martin H., 4,073,624, Cl. 44-1.00R.
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Scotto, Vincent Anthony: *See—*
Buckley, Frederick, III; Miller, Gerald Aberdeen; and Scotto, Vincent Anthony, 4,074,151, Cl. 307-362.000.
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Komatsu, Sadaharu, 4,073,233, Cl. 101-132.500.
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Bull, Michael J.; and Searle, Robert J. G., 4,073,812, Cl. 260-613.00R.
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Dexter, John L.; Kyser, Edmond L.; Mitchell, Charles S.; and Sears, Stephan B., 4,074,284, Cl. 346-140.00R.
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Seger, Michael: *See—*
Kraemer, Stefan; Seger, Michael; and Seidl, Alois, 4,073,729, Cl. 210-80.000.
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Kraemer, Stefan; Seger, Michael; and Seidl, Alois, 4,073,729, Cl. 210-80.000.
Seidl, Otto: *See—*
Finsterwalder, Ulrich; and Seidl, Otto, 4,073,115, Cl. 52-745.000.
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Selwyn, Michael Frederick James, to Rank Xerox Ltd. Corotron apparatus. 4,073,587, Cl. 355-3.0CH.
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Kandul, Jury Vasilievich; Semeny, Valery Yakovlevich; Pivovarov, Mikhail Danilovich; Malovik, Vladlen Vasilievich; Mazepa, Ivan Karpovich; and Feschenko, Ninel Gavrilovna, 4,073,809, Cl. 260-606.50P.
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Seno, Katsumi: *See—*
Takagi, Nobuho; Takase, Mituo; Itoh, Takashi; Seno, Katsumi; and Koseki, Toshihiko, 4,073,594, Cl. 415-1.000.
Sepaniac, Walter J., to Raymond Lee Organization, Inc., The. Tennis net. 4,073,491, Cl. 273-29.00B.
Serino, Yoichi: *See—*
Hashimoto, Kametaro; Ushitani, Kenji; Serino, Yoichi; and Arakawa, Tadaoki, 4,073,474, Cl. 251-368.000.
Service Sequence Systems: *See—*
Palter, Herman, 4,073,422, Cl. 226-129.000.
Seton Name Plate Corporation: *See—*
Licata, Aurelio William, 4,073,671, Cl. 156-219.000.
SGS-ATES Componenti Elettronici S.p.A.: *See—*
D'Arrigo, Sebastiano; and Ghiringhelli, Giovanni, 4,074,334, Cl. 361-79.000.
Shakespeare Company: *See—*
Fulmer, Leon F., Sr., 4,073,417, Cl. 224-42.10G.
Shaner, Donald R.: *See—*
Nordberg, Svein T.; and Shaner, Donald R., 4,074,219, Cl. 337-186.000.
Shapiro. Stanley: *See—*
Caron, Ronald N.; and Shapiro, Stanley, 4,073,667, Cl. 148-12.70C.
Sharp, Bernard C.: *See—*
Lopez, Manuel; and Sharp, Bernard C., 4,073,461, Cl. 248-475.00R.
Sharp Kabushiki Kaisha: *See—*
Washizuka, Isamu; Hashimoto, Shintaro; and Katsui, Saburo, 4,074,118, Cl. 364-712.000.
Sharpe, Raymond; and Darnbrough, Kenneth, to Lucas Industries Limited. Electric current generator arrangements. 4,074,180, Cl. 322-29.000.
Shavel, John, Jr.: *See—*
Zinnes, Harold; Lindo, Neil A.; and Shavel, John, Jr., 4,074,048, Cl. 544-49.000.
Shaw, Milton C.; and Hoshi, Tetsutaro, to Carnegie-Mellon University. Shave forming of wire. 4,073,214, Cl. 90-24.00D.
Shay, Joseph Leo: *See—*
Johnston, Wilbur Dexter, Jr.; and Shay, Joseph Leo, 4,074,305, Cl. 357-67.000.
Shell Oil Company: *See—*
Bull, Michael J.; and Searle, Robert J. G., 4,073,812, Cl. 260-613.00R.
Cornforth, John W.; Schofield, John A.; French, Sidney J.; and Gray, Robin T., 4,073,815, Cl. 260-619.00A.
Kanbier, Dirk; and Goudriaan, Frans, 4,073,721, Cl. 208-251.00H.
Shenoha, James L., to Norwood Marking and Equipment Co., Inc. Packaging machine with inflated bag printer and method. 4,073,117, Cl. 53-14.000.
Shephard, Margaret Claire: *See—*
Balasubramanyan, Sugavanam; Shephard, Margaret Claire; and Crowley, Patrick Jelf, 4,073,923, Cl. 424-273.00R.
Balasubramanyan, Sugavanam; and Shephard, Margaret Claire, 4,073,925, Cl. 424-273.00R.
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Shima, Masahiro, 4,073,164, Cl. 66-65.000.
Shima, Masahiro, to Shima Idea Center Company Ltd. Glove knitting apparatus. 4,073,164, Cl. 66-65.000.
Shimokobe, Ikuo: *See—*
Takeuchi, Seiji; Fujita, Kazunori; and Shimokobe, Ikuo, 4,073,725, Cl. 210-31.00C.
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Shimoyama, Kunio: *See—*
Matsuzaki, Soichiro; Maitani, Yoshihisa; Shimoyama, Kunio; and Kondo, Isao, 4,074,290, Cl. 354-34.000.
Shin-Etsu Chemical Co., Ltd.: *See—*
Imai, Kiyoshi; Hasebe, Nobuyuki; Asami, Tomiaki; Soga, Setsuo; Fukushima, Ichiro; and Asahina, Yasuo, 4,074,001, Cl. 428-329.000.
Shinko Electric Company, Ltd.: *See—*
Murakami, Kanemichi; Ishida, Yoshihiro; and Okubo, Kazuo, 4,074,333, Cl. 361-13.000.
Shinozuka, Isao: *See—*
Doi, Tsunesuke; Komoto, Hiroshi; Chono, Masazumi; Inoue, Akira; Saito, Kazuaki; and Shinozuka, Isao, 4,073,618, Cl. 21-2.70R.
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Yokoi, Hiroshi; and Shiokawa, Takayasu, 4,074,266, Cl. 343-100.0SA.
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Kondo, Eiji; and Mitsugi, Takashi, 4,073,687, Cl. 195-36.00P.
Shiren, Norman Steven: *See—*
Melcher, Robert Lee; and Shiren, Norman Steven, 4,074,240, Cl. 365-192.000.
Shmidt, Petr Genrikhovich: *See—*
Korshunov, Evgeny Alexeevich; Bainov, Nikolai Ivanovich; Petrov, Igor Nikolaevich; Konovalov, Georgy Fedorovich; Arshansky, Mikhail Iosipovich; Shmidt, Petr Genrikhovich; Kostrov, Valery Pavlovich; and Efremov, Petr Evgenievich, 4,073,333, Cl. 164-66.000.
Shook, Norma G.: *See—*
Heitzman, Gary N.; and Shook, Norma G., 4,073,591, Cl. 403-24.000.
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Siegel, Robert H.: *See—*
Sumida, Kunio A., 4,073,349, Cl. 173-59.000.

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Baumgartner, Werner; and Schnoeller, Manfred, 4,073,859, Cl. 264-322.000.
Benda, Hansjochen; and Huber, Peter, 4,074,303, Cl. 357-33.000.
Buchta, Karl, 4,074,200, Cl. 325-335.000.
Dragotinov, Alexander; and Hartmann, Harro Lothar, 4,074,080, Cl. 178-69.100.
Fink, Wolfgang; and Graf, Peter, 4,074,283, Cl. 346-139.00C.
Friedrich, Hans, 4,073,990, Cl. 428-138.000.
Horninger, Karlheinrich, 4,074,206, Cl. 330-269.000.
Kohler, Werner, 4,074,193, Cl. 324-126.000.
Muller, Kurt; Richter, Friedrich; and Schramm, Heinz-Helmut, 4,074,064, Cl. 174-28.000.
Prey, Gerhard, 4,074,229, Cl. 340-146.1AG.
Salzmann, Theodor; Timpe, Wolfgang; and Weibelzahl, Manfred, 4,074,348, Cl. 363-160.000.

Sierputowski, Piotr: *See—*
Ostrowski, Jerzy; Sierputowski, Piotr; Turkowski, Lukasz; Jablkiewicz, Jerzy; Pacholski, Jan; and Jedryka, Tadeusz, 4,073,128, Cl. 57-58.890.
Ostrowski, Jerzy; Sierputowski, Piotr; Turkowski, Lukasz; Jablkiewicz, Jerzy; Pacholski, Jan; and Jedryka, Tadeusz, 4,073,129, Cl. 57-58.890.

Sigl, Winfrid: *See—*
Barnickel, Heinrich; Sigl, Winfrid; and Schwable, Jorg, 4,073,838, Cl. 264-37.000.

Signode Corporation: *See—*
Angarola, Barry R.; and Robbins, James A., 4,073,389, Cl. 214-10.50D.

Sih, Charles John: *See—*
Woessner, Warren Dexter; Sih, Charles John; Kluender, Harold Clinton; Arndt, Henry Clifford; and Biddlecom, William Gerard, 4,074,063, Cl. 560-121.000.

Sikes, Gail T.: *See—*
Harris, Robert J.; and Sikes, Gail T., 4,073,760, Cl. 260-28.5AS.

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Fleming, Robert W.; Sill, Arthur D.; and Sweet, Francis W., 4,073,904, Cl. 424-248.580.

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Silonics, Inc.: *See—*
Dexter, John L.; Kyser, Edmond L.; Mitchell, Charles S.; and Sears, Stephan B., 4,074,284, Cl. 346-140.00R.

Silvis, Duane Charles: *See—*
Davis, Earl Klimer; Rogers, William Oakley; and Silvis, Duane Charles, 4,073,657, Cl. 106-73.500.

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Ladenberger, Volker; Bronstert, Klaus; Hovemann, Friedrich; and Simak, Petr, 4,073,738, Cl. 252-56.00R.

Simis, Evgeny Moiseevich: *See—*
Minichev, Vasily Mikhailovich; Simis, Evgeny Moiseevich; and Judin, Vladimir Konstantinovich, 4,074,161, Cl. 310-194.000.

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Simokat, Frank L., to TII Corporation. Multi-element surge arrester. 4,074,338, Cl. 361-129.000.

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Simoons, John R. A.: *See—*
Wyburn-Mason, Roger, 4,073,922, Cl. 424-273.00R.

Simplimatic Engineering Co.: *See—*
Bowser, Robert E., 4,073,387, Cl. 214-6.00P.

Singh, Gurdial: *See—*
Kuo, Benjamin C.; Frus, John R.; and Singh, Gurdial, 4,074,179, Cl. 318-696.000.

Sio-Societa per l'Industria dell'Ossigeno e di Altri Gas S.p.a.: *See—*
Danioni, Francesco, 4,073,443, Cl. 241-65.000.

Siskin, Michael, to Exxon Research & Engineering Co. SO_2 Stripping in fluorosulfuric acid catalyst regeneration. 4,073,821, Cl. 260-683.470.

Skalka, Paul: *See—*
Salvati, John G.; and Skalka, Paul, 4,074,218, Cl. 335-176.000.

Skega Aktiebolag: *See—*
Nystrom, K. Sture, 4,073,316, Cl. 137-829.000.

SKF Nova AB: *See—*
Lundgren, Bengt; and Nilsson, Sven Walter, 4,073,547, Cl. 308-6.00C.

Skischuhfabrik Dynafit Gesellschaft m.b.H.: *See—*
Seidel, Sigurd, 4,073,073, Cl. 36-50.000.

Skotynsky, Paul N.: *See—*
Burkholder, Theodore B.; Stalter, Robert J.; and Skotynsky, Paul N., 4,073,839, Cl. 264-45.100.

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Sloane, Howard J.: *See—*
Way, Allan S.; Glenn, Thomas J.; Sloane, Howard J.; and Keahl, Gerald T., 4,074,272, Cl. 346-33.00A.

Smallwood, John J., to Fairchild Industries, Inc. Valve apparatus. 4,073,313, Cl. 137-625.600.

Smathers, Kenneth: *See—*
Liebscher, Anton; Oberg, Sven; Smathers, Kenneth; and Auberry, Horace, 4,073,023, Cl. 12-142.0RS.

Smith, Douglas A., to Burroughs Corporation. Plural-track record disk initialization system. 4,074,326, Cl. 360-55.000.

Smith, Jack James, to BOC Limited. Supporting device. 4,073,483, Cl. 269-25.000.

Smith, John Lynn: *See—*
Ehrsam, William Friedrich; Meyer, Carl H. W.; Smith, John Lynn; and Tuchman, Walter Leonard, 4,074,066, Cl. 178-22.000.

Smith, Layle V., to Dow Chemical Company, The. Method for preparing foam plastic loose fill packing. 4,073,842, Cl. 264-53.000.

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Kaiser, Carl; and Lafferty, John Joseph, 4,073,912, Cl. 424-267.000.

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Snowdon, Brian, to Macawber Engineering Limited. Material handling apparatus. 4,073,244, Cl. 110-165.00R.

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Beny, Janos; Ryan, John W.; and Snyder, Edward, III, 4,073,088, Cl. 46-265.000.

Snyder, Martin, to Pettibone Laboratories, Inc. Chlorine dioxide and quaternary ammonium salts as sterilizing agents. 4,073,888, Cl. 424-149.000.

Societe Anonyme de Telecommunications: *See—*
Boutmy, Patrick E.; and Walraet, Jean G., 4,074,074, Cl. 179-15.0BW.

Societe Anonyme des Ateliers Houget Duesberg Bosson: *See—*
Bouhon, Pierre Hubert Marie Joseph, 4,073,126, Cl. 57-58.950.

Societe Anonyme Dite: Nodet-Gougis: *See—*
Grataloup, Xavier Roger, 4,073,439, Cl. 239-655.000.

Societe Anonyme dite : Societe Europeenne de Propulsion: *See—*
Stauff, Emile J., 4,073,213, Cl. 89-1.701.

Societe d'Applications Generales d'Electricite et de Mecanique (SAGEM): *See—*
Dore, Alain; Picard, Jean; and Rochereau, Jacques, 4,074,258, Cl. 340-347.00P.

Societe d'Assistance Technique pour Produits Nestle, S.A.: *See—*
Gasser, Rupert Josef; and Huster, Lienhard Bodo, 4,073,961, Cl. 426-589.000.

Societe d'Etudes de Produits Chimiques: *See—*
Esanu, Andre, 4,073,895, Cl. 424-200.000.

Societe Francaise d'Electrometallurgie: *See—*
Montanteme, Jean; Greffe, Andre; and Grandjacques, Francois, 4,073,641, Cl. 75-11.000.

Societe Generale de Constructions Electriques et Mecaniques "Alsthom et Cie": *See—*
Regnaut, Bernard, 4,074,020, Cl. 429-34.000.

Societe Nouvelle des Bennes Saphem: *See—*
Derain, Christian, 4,073,396, Cl. 214-515.000.

Societe Toulousaine de Produits Chimiques "Tolochimie": *See—*
Doubovetzky, Serge; Forschner, Peter; and Montazeau, Francois, 4,073,806, Cl. 260-544.00K.

Soda, Atsuhiko: *See—*
Okasaka, Hotsuma; Nakamura, Kiyokazu; Morikawa, Masanobu; Tsunashima, Kenji; and Soda, Atsuhiko, 4,073,827, Cl. 260-835.000.

Soffa, Albert: *See—*
Kulicke, Frederick W., Jr.; Soffa, Albert; Vilenski, Dan; and Brockmann, Asher, 4,073,424, Cl. 228-4.500.

Soga, Mitsuo; Takase, Yuuzo; Ishikawa, Manabu; Nakazawa, Masahiko; and Nakayama, Mutumi, to Asahi Denka Kogyo K.K. Hardenable composition. 4,074,034, Cl. 526-56.000.

Soga, Setsuo: *See—*
Imai, Kiyoshi; Hasebe, Nobuyuki; Asami, Tomiaki; Soga, Setsuo; Fukushima, Ichiro; and Asahina, Yasuo, 4,074,001, Cl. 428-329.000.

Solaron Corporation: *See—*
Lof, George O. G., 4,073,283, Cl. 126-270.000.

Solf, Johannes; and Eicker, Rolf, to H. Eicker & Sohne. Barber scissors. 4,073,058, Cl. 30-257.000.

Solie, James C.: *See—*
McClocklin, Samuel B.; and Solie, James C., 4,073,315, Cl. 137-629.000.

Solomon, Anthony T.: *See—*
Crawford, William B.; and Solomon, Anthony T., 4,073,246, Cl. 112-121.110.

Son, Pyong-Nae; and Layer, Robert Wesley, to B. F. Goodrich Company, The. Substituted decahydroquinolines and their use as ultraviolet light stabilizers. 4,073,770, Cl. 260-45.8NW.

Sonntag, Norman O. V., to Glyco Chemicals, Inc. Hydantoin derivatives and broad spectrum bactericidal/fungicidal compositions thereof. 4,073,924, Cl. 424-273.00R.

Sonntag, Norman O. V.; and Freilich, John Douglas, to Glyco Chemicals, Inc. Mono-quaternary ammonium salts of hydantoin and compositions thereof. 4,073,926, Cl. 424-273.00R.

Sony Corporation: *See—*
Ohsawa, Mitsuo, 4,074,075, Cl. 179-15.0BT.

Sorenson, Richard D.: *See—*
Hart, Charles G.; Gordon, John S.; and Sorenson, Richard D., 4,073,375, Cl. 198-466.000.

Southern Pacific Transportation Company: *See—*
Biaggini, Benjamin F.; and Garin, Paul V., 4,073,394, Cl. 214-145.00R.

Southwire Company: *See—*
Womack, William B. M.; Starnes, Ralph Emory, Jr.; Headrick, John Charles; and Martin, Ronald Ray, 4,073,978, Cl. 427-235.000.

Soykan, Ferhun H., to Special Metals Corporation. Method of melting slag. 4,073,640, Cl. 75-10.00R.

Spampinato, Dominic Patrick, to International Business Machines Corporation. Word line clamping circuit and decoder. 4,074,237, Cl. 365-230.000.

Spar Aerospace Products Limited: *See—*
Taylor, Henry James; and Ibbotson, Philip Nicholas Peter, 4,073,201, Cl. 74-665.00L.

Spartus Corporation: *See—*
Jauch, Christian M. J., 4,073,130, Cl. 58-9.000.

Spata, James M.; and Diel, Roger L., to Ralston Purina Company. Process for the production of a protein product. 4,073,962, Cl. 426-646.000.

Spaziante, Placido Maria; Santi, Rinaldo; and De Nora, Vittorio, to Parel Societe Anonyme. Method of operating a circulating bed cell. 4,073,707, Cl. 204-105.00R.

Special Metals Corporation: *See—*
Soykan, Ferhun H., 4,073,640, Cl. 75-10.00R.

Specker, Manfred: *See—*
Metz, Gunter; and Specker, Manfred, 4,073,918, Cl. 424-270.000.

Speckhard, Arthur. Digital printout arrangement with magnetic field carriage drive. 4,074,067, Cl. 178-23.00R.

Speelman, Irving A.; and Raczkowski, Jan, to Propper Manufacturing Co., Inc. Disposable valve. 4,073,314, Cl. 137-625.470.

Spence, Junior C.; Rorrer, Robert J.; and Holt, James L., to J.P. Stevens & Co., Inc. Double catch thread narrow weave fabric. 4,073,320, Cl. 139-383.00R.

Sperry, Raymond L.: *See—*
Moriconi, Dario J., 4,073,227, Cl. 100-52.000.

Sperry, Selma: *See—*
Moriconi, Dario J., 4,073,227, Cl. 100-52.000.

Spisak, Steve: *See—*
Shoup, Thomas E.; and Spisak, Steve, 4,074,103, Cl. 219-98.000.

Sprecker, Mark A.: *See—*
Hall, John B.; Sprecker, Mark A.; Schmitt, Frederick Louis; and Vock, Manfred Hugo, 4,073,751, Cl. 252-522.000.

Square D Company: *See—*
Clarke, Geoffrey, 4,074,336, Cl. 361-88.000.

Squassoni, Gino F.: *See—*
Teumer, Roger G.; Warter, Peter J., Jr.; Squassoni, Gino F.; Tulagin, Vseevolod; and Egnaczak, Raymond K., 4,073,583, Cl. 355-3.00P.

Stach, Leonard J.; and Wilke, Robert N., to Velsicol Chemical Corporation. Oxadiazolidine substituted phosphorus compounds. 4,073,894, Cl. 424-200.000.

Stadie, Lothar; and Wittchow, Eberhard, to Kraftwerk Union Aktiengesellschaft. Fuel and feedwater-monitoring system of a once-through steam generator. 4,074,360, Cl. 364-551.000.

Stahle, Helmut: *See—*
Kummer, Werner; Koppe, Herbert; Stahle, Helmut; and Haarmann, Walter, 4,073,905, Cl. 424-248.560.

Stahlin, Walter: *See—*
Schmidt, Walter; and Stahlin, Walter, 4,073,355, Cl. 177-83.000.

Stalter, Robert J.; and Burkholder, Theodore B., to Goodyear Tire & Rubber Company, The. Contoured foam mattress. 4,073,020, Cl. 5-355.000.

Stalter, Robert J.: *See—*
Burkholder, Theodore B.; Stalter, Robert J.; and Skotynsky, Paul N., 4,073,839, Cl. 264-45.100.

Stam, John G.: *See—*
Hamanaka, Ernest S.; and Stam, John G., 4,073,783, Cl. 260-239.100.

Standard Oil Company, The: *See—*
Li, George S., 4,074,037, Cl. 526-280.000.
Li, George S., 4,074,038, Cl. 526-280.000.

Standard Oil Company (Indiana): *See—*
Cerefice, Steven A.; and Fields, Ellis K., 4,073,794, Cl. 260-326.00C.
Grutsch, James F.; Mallatt, Russell C.; and Steely, Benjamin F., 4,073,722, Cl. 210-5.000.
Lark, John C., 4,073,993, Cl. 428-261.000.

Standing, Charles N.; and Olabode, Hamilton A., to Pillsbury Company, The. Method of making dehydrated potato. 4,073,952, Cl. 426-242.000.

Stanley, James Robert; and Topham, Silas Charles, to Medical Development Corporation. Negative pressure drainage vessel. 4,073,294, Cl. 128-278.000.

Stanley, Philip E.: *See—*
Woods, William E.; Stanley, Philip E.; Izbicki, Kenneth J.; and Ramsdell, Steven C., 4,074,353, Cl. 364-200.000.

Stanley Tools Limited: *See—*
Gilbert, Richard, 4,073,057, Cl. 30-153.000.

Stansberry, Richard: *See—*
McKenzie, Roland W.; and Stansberry, Richard, 4,073,393, Cl. 214-83.300.

Stanton, Raymond E.: *See—*
Gray, Michael James; and Stanton, Raymond E., 4,073,620, Cl. 23-253.00R.

Starnes, Ralph Emory, Jr.: *See—*
Womack, William B. M.; Starnes, Ralph Emory, Jr.; Headrick, John Charles; and Martin, Ronald Ray, 4,073,978, Cl. 427-235.000.

Staudenrausch, Georg: *See—*
Muller, Johann; Weerth, Hans Ernst; and Staudenrausch, Georg, 4,073,039, Cl. 17-1.00F.

Stauff, Emile J., to Societe Anonyme dite : Societe Europeenne de Propulsion. Assembly for launching a projectile. 4,073,213, Cl. 89-1.701.

Ste Anonyme dite: Ateliers et Chantiers de Bretagne - A CB: *See—*
Colin, Jean-Paul, 4,073,217, Cl. 92-27.000.

Steel Storage Systems, Inc.: *See—*
Fahey, Thomas D.; and Schlagel, Samuel, 4,073,382, Cl. 211-1.000.

Steely, Benjamin F.: *See—*
Grutsch, James F.; Mallatt, Russell C.; and Steely, Benjamin F., 4,073,722, Cl. 210-5.000.

Steen, Donald B., to United States of America, Navy. Coaxial, polarity-reversing switch. 4,074,099, Cl. 200-153.00S.

Steever, Andrew Beaumont; and Svencer, Richard Ernest, to Dorr-Oliver Incorporated. Refractory construction dome for fluidized bed reactor. 4,073,064, Cl. 34-57.00A.

Stege, Heinz: *See—*
Mergner, Dietrich; and Stege, Heinz, 4,073,987, Cl. 428-81.000.

Stein, Werner: *See—*
Koch, Karlheinz; Kolaczinski, Gerhard; Rupilius, Wolfgang; and Stein, Werner, 4,074,013, Cl. 428-457.000.

Steinbeck, Hermann: *See—*
Hofmeister, Helmut; Laurent, Henry; Wiechert, Rudolf; Annen, Klaus; and Steinbeck, Hermann, 4,073,900, Cl. 424-243.000.

Steinbicker, Richard N.; and Rauch, Stewart E., to Bethlehem Steel Corporation. Acid electrotinning bath. 4,073,701, Cl. 204-54.00R.

Steinert, Wolfgang; and Ekstrom, Bo, to Licentia Patent-Verwaltungs-G.m.b.H. Code word determination. 4,074,119, Cl. 364-807.000.

Steinmann, Eugene B., Jr. Automobile body dent puller tool. 4,073,181, Cl. 72-479.000.

Stephens, John A.: *See—*
Kuhn, Martin C.; Stephens, John A.; Noakes, Michael J.; and Rovig, Allen D., 4,073,479, Cl. 266-173.000.

Stephens, Ronald M. Device for impregnating paper. 4,073,264, Cl. 118-250.000.

Steprath, Werner: *See—*
Buzga, Heinrich; Steprath, Werner; and Pause, Kurt, 4,073,661, Cl. 134-1.000.

Stermer, Philip Eli: *See—*
Buljan, Sergej Tomislav; and Stermer, Philip Eli, 4,073,845, Cl. 264-65.000.

Stetter, Joseph R.: *See—*
Blurton, Keith F.; and Stetter, Joseph R., 4,073,698, Cl. 204-1.00T.

Stevens, Amy L. Portable playpen. 4,073,017, Cl. 5-97.000.

Stevens Engineering: *See—*
Coope, Robert L.; and Munson, Lowell W., 4,073,215, Cl. 90-58.00R.

Stevens, John, to Minnesota Mining and Manufacturing Company. 3-Pyrazolidinone derivatives. 4,074,051, Cl. 544-140.000.

Stevens, Petrus Franciscus, to U.S. Philips Corporation. Gamma camera in which only the three largest signals are used for position determination. 4,074,135, Cl. 250-366.000.

Stewart, Lionel G.: *See—*
Fishbaugh, Byron L.; Keller, Harold E.; and Stewart, Lionel G., 4,073,047, Cl. 29-450.000.

Stilexo Johansson & Co. Aktiebolag: *See—*
Lexnas, Sven-Olof, 4,073,033, Cl. 16-52.000.

Stires, John C., III. Strip chart recorder. 4,074,275, Cl. 346-19.000.

Stirling, Irene: *See—*
Wood, Hamish Christopher Swan; and Stirling, Irene, 4,073,786, Cl. 260-251.500.

Stith, Morris Randall, Jr. Valve. 4,073,308, Cl. 137-340.000.

Stix, Nathan, to United States Shoe Corporation, The. Method of making a shoe. 4,073,024, Cl. 12-142.00J.

Stockdale, Roy, to Napco Security Systems, Inc. Dual operating control circuits for intrusion detection systems. 4,074,248, Cl. 340-276.000.

Stockman, Richard Franklin, to Air Preheater Company, Inc., The. Rotary regenerator pin rack seal. 4,073,337, Cl. 165-9.000.

Stoessel, Herman V.; and Prichard, Daniel R., to Hesston Corporation. Feed rolls having automatic speed control. 4,073,377, Cl. 198-624.000.

Stone, Raymond S.: *See—*
Bosworth, Clive J.; Bridgstock, Neil E.; Stone, Raymond S.; and McLaughlin, William L., 4,073,260, Cl. 118-8.000.

Stoneking, Richard D.: *See—*
Kaduki, Charles L.; and Stoneking, Richard D., 4,073,611, Cl. 431-45.000.

Stora Kopparbergs Bergslags Aktiebolag: *See—*
Collin, Per Harald; Flink, Sune Natanael; Widell, Bjorn; Hirsch, Martin; and Reh, Lothar, 4,073,642, Cl. 75-35.000.

Storm, Nelson "Jack", to Custom Trailers Mfg., Inc. Method and apparatus for providing a power screed board. 4,073,593, Cl. 404-114.000.

Stremeckus, Robert. Fish lure box. 4,073,085, Cl. 43-54.50R.

Strong, Herbert M.; and Tuft, Roy E., to General Electric Company. High pressure reaction vessel for quality control of diamond growth on diamond seed. 4,073,380, Cl. 206-219.000.

Stuby, Kenneth P.: *See—*
Honn, James Joseph; and Stuby, Kenneth P., 4,074,342, Cl. 361-411.000.

Stuckmann, Dieter; and Jutte, Hans, to Gewerkschaft Eisenhutte Westfalia. Drive shields for tunnelling. 4,073,153, Cl. 61-85.000.

Studier, Martin H.: *See—*
Huston, John L.; Scott, Robert G.; and Studier, Martin H., 4,073,624, Cl. 44-1.00R.

Sugahara, Hirozo: *See—*
Ichikawa, Hiroshi; Sugimoto, Michio; Mizokami, Shigeyoshi; Honna, Kosaku; and Sugahara, Hirozo, 4,073,818, Cl. 260-668.00F.

Sugie, Akihiko: *See—*
Shimomura, Hiromi; Sugie, Akihiko; Katsube, Junki; and Yamamoto, Hisao, 4,073,933, Cl. 424-299.000.

Sugimoto, Michio: *See—*
Ichikawa, Hiroshi; Sugimoto, Michio; Mizokami, Shigeyoshi; Honna, Kosaku; and Sugahara, Hirozo, 4,073,818, Cl. 260-668.00F.

Sugimoto, Mikio: *See—*
Kishitani, Masatoshi; Tamagaki, Yoshiteru; Matsumoto, Takeji; Sugimoto, Mikio; and Namiki, Noriaki, 4,073,152, Cl. 61-63.000.

Sugiura, Akio; and Nojiri, Tadao, to Nippondenso Co., Ltd. Method and apparatus to read-in bar-coded information. 4,074,115, Cl. 235-462.000.

Suh, John T., to Nicholas International Limited. Preparation of ethylamine derivatives. 4,073,798, Cl. 260-340.50R.

Sullivan, Albert M., Jr., to United States of America, Army. Code signal processing circuitry for IFF transponder beacon. 4,074,263, Cl. 343-6.8LC.

Sullivan, John L.: *See—*
Galkiewicz, Thomas M.; Petersen, Kenneth C.; and Sullivan, John L., 4,073,776, Cl. 260-51.0EP.
Galkiewicz, Thomas M.; Petersen, Kenneth C.; and Sullivan, John L., 4,073,826, Cl. 260-831.000.

Sulzer Brothers Limited: *See—*
Bosshard, Ernst, 4,074,138, Cl. 250-435.000.

Sumida, Kunio A., to Siegel, Robert H.; and Albin, Maurice, as coexecutors of the estate of Leonard V. Shapiro, deceased. Balanced reciprocating tool driven by rotary motion. 4,073,349, Cl. 173-59.000.

Sumikin Coke Company Limited: *See—*
Kiritani, Yoshio; Tsuyuguchi, Michio; Ibaragi, Tetsuo; Yano, Katsuhiro; Sunami, Yoshihiko; Nishioka, Kunihiko; and Sumikin Coke Company Limited, 4,073,625, Cl. 44-10.00R.

Sumitomo Chemical Company, Limited: *See—*
Shimomura, Hiromi; Sugie, Akihiko; Katsube, Junki; and Yamamoto, Hisao, 4,073,933, Cl. 424-299.000.
Tabana, Minoru; Mitsuno, Tatsuyuki; Maki, Hiroshi; and Narisawa, Shizuo, 4,073,831, Cl. 260-876.00B.
Wada, Motomu; Inoue, Masakazu; Furukawa, Kazunori; and Matsubara, Shigeyoshi, 4,073,844, Cl. 264-55.000.

Sumitomo Metal Industries Limited: *See—*
Kiritani, Yoshio; Tsuyuguchi, Michio; Ibaragi, Tetsuo; Yano, Katsuhiro; Sunami, Yoshihiko; Nishioka, Kunihiko; and Sumikin Coke Company Limited, 4,073,625, Cl. 44-10.00R.

Sumrell, Gene: *See—*
Bailey, August V.; Boudreaux, Gordon J.; Sumrell, Gene; and Novak, Arthur F., 4,074,058, Cl. 560-105.000.

Sun Electric Corporation: *See—*
Voross, Zoltan, 4,074,183, Cl. 324-16.00R.

Sun Oil Company Limited: *See—*
Lea, James F., 4,073,144, Cl. 61-1.00R.

Sun Oil Company of Pennsylvania: *See—*
Seitzer, Walter H., 4,073,819, Cl. 260-674.00N.

Sun Ventures, Inc.: *See—*
Cassar, Richard D., 4,073,896, Cl. 424-205.000.

Sunami, Yoshihiko: *See—*
Kiritani, Yoshio; Tsuyuguchi, Michio; Ibaragi, Tetsuo; Yano, Katsuhiro; Sunami, Yoshihiko; Nishioka, Kunihiko; and Sumikin Coke Company Limited, 4,073,625, Cl. 44-10.00R.

Suntech, Inc.: *See—*
Lerner, Julius; and Iglesias, Edmundo J., 4,073,304, Cl. 137-101.210.
Mayer, Robert, 4,074,242, Cl. 340-213.100.

Suppanen, Pekka Ilkka Juhani, to Kemira Oy. Process for producing a slurry suitable for the manufacture of a mixed fertilizer containing nitrogen plus phosphorus. 4,073,635, Cl. 71-34.000.

Surpass Chemicals Limited: *See—*
Eliades, Theo Ioannou; and Ramirez, Noemi Bernardo, 4,073,744, Cl. 252-389.00R.

Sutowski, Walter S., to Freeway Corporation. Rolling type bearing and method for making same. 4,073,551, Cl. 308-195.000.

Suzuki, Ikuo: *See—*
Asaeda, Toshio; Suzuki, Ikuo; Imai, Tomoyasu; Kitajima, Masato; and Hota, Kazunori, 4,073,281, Cl. 125-11.0CD.

Suzuki, Makoto: *See—*
Otomo, Koju; Itoh, Takeshi; Hayashi, Kazuyuki; Omoto, Hiroshi; Yui, Takayuki; and Suzuki, Makoto, 4,074,232, Cl. 340-147.00R.

Suzuki, Masatoshi: *See—*
Fujikake, Kenji; Amaki, Isamu; and Suzuki, Masatoshi, 4,073,338, Cl. 165-86.000.

Suzuki, Ryotaro, to Fuji Photo Optical Co., Ltd. Automatic exposure control device for a camera including automatic film speed setting means. 4,074,286, Cl. 354-21.000.

Svehaug, Henry V.: *See—*
Davis, Walter L.; and Svehaug, Henry V., 4,073,041, Cl. 17-71.000.

Svencer, Richard Ernest: *See—*
Steever, Andrew Beaumont; and Svencer, Richard Ernest, 4,073,064, Cl. 34-57.00A.

Swain, Richard Slaughter, to Norlin Music, Inc. Selection switch memory circuit. 4,074,233, Cl. 340-147.0LP.

Swank, Roy L.; and Danon, David. Anti-coagulating and filtering blood. 4,073,723, Cl. 210-23.00R.

Sweet, Francis W.: *See—*
Fleming, Robert W.; Sill, Arthur D.; and Sweet, Francis W., 4,073,904, Cl. 424-248.580.

Swessel, John A., Jr.: *See—*
Hults, Harold W.; and Swessel, John A., Jr., 4,074,100, Cl. 200-339.000.

Switchcraft, Inc.: *See—*
Bailey, James R.; and Lavigne, Vernon W., 4,073,563, Cl. 339-128.000.

Symon, Roger James, to Rolls-Royce (1971) Limited. Fuel system for gas turbine engines. 4,073,136, Cl. 60-39.28R.

Synchro-Start Products, Inc.: *See—*
Lace, Melvin A., 4,074,157, Cl. 310-67.00R.

Systems Engineering & Manufacturing Corporation: *See—*
Shorr, Jacob; and Fishman, Herbert, 4,073,730, Cl. 210-321.00R.

Systron-Donner Corporation: *See—*
Bower, Gerald Shelton, 4,074,178, Cl. 318-631.000.

Szalai, Gabor, to Magyar Vagon- es Gepgyar. Vehicle driving gear system. 4,073,358, Cl. 180-75.000.

Szarvasi Vas-Femipari Szovetkezet: *See—*
Csenky, Laszlo, 4,074,092, Cl. 200-51.070.

Szewczuk, Thomas M.: *See—*
Allen, James M.; and Szewczuk, Thomas M., 4,073,599, Cl. 416-97.00R.

Szonntagh, Eugene L., to Honeywell Inc. Method of making a reference electrode. 4,073,052, Cl. 29-570.000.

Szonntagh, Eugene L., to Honeywell Inc. Method of making an ion responsive electrode. 4,073,053, Cl. 29-570.000.

Tabana, Minoru; Mitsuno, Tatsuyuki; Maki, Hiroshi; and Narisawa, Shizuo, to Sumitomo Chemical Company, Limited. Thermoplastic resin composition. 4,073,831, Cl. 260-876.00B.

Tabe, Yutaka: *See—*
Kouzai, Keiji; Tabe, Yutaka; Masunaga, Eiji; and Matsuda, Kichiro, 4,073,837, Cl. 264-38.000.

Tabler, Herman L.; Tabler, Regine M.; and Lokey, Edwin L. Dispensing apparatus with self contained spout. 4,073,413, Cl. 222-529.000.

Tabler, Regine M.: *See—*
Tabler, Herman L.; Tabler, Regine M.; and Lokey, Edwin L., 4,073,413, Cl. 222-529.000.

Tai, Wun Ten, to Nalco Chemical Company. Stabilization of cationically modified acrylamide polymers. 4,073,763, Cl. 260-29.4UA.

Tajima, Shigeo: *See—*
Murota, Kozo; Matsumoto, Rempei; Yasuma, Toru; Morinaga, Mamoru; Tajima, Shigeo; Nakamura, Masayuki; and Sakaguchi, Akira, 4,073,361, Cl. 181-228.000.

Tajima, Tetsuya: *See—*
Kawashima, Hidetoshi; Ohtake, Shinzaburo; Fujimori, Toru; Ohkawa, Isao; and Tajima, Tetsuya, 4,073,910, Cl. 424-266.000.

Takada, Shinichi, to Kabushiki Kaisha Komatsu Seisakusho. Device for releasably locking a cap on a closed position. 4,073,168, Cl. 70-165.000.

Takagi, Nobuho; Takase, Mituo; Itoh, Takashi; Seno, Katsumi; and Koseki, Toshihiko, to Hitachi, Ltd. Pump starting method for hydraulic machinery. 4,073,594, Cl. 415-1.000.

Takakura, Koichi: *See—*
Yamauchi, Kazuhisa; Takakura, Koichi; Kawai, Syuji; and Ohmori, Akio, 4,073,733, Cl. 210-500.00M.

Takara Co., Ltd.: *See—*
Ogawa, Iwakichi, 4,073,086, Cl. 46-91.000.

Takase, Mituo: *See—*
Takagi, Nobuho; Takase, Mituo; Itoh, Takashi; Seno, Katsumi; and Koseki, Toshihiko, 4,073,594, Cl. 415-1.000.

Takase, Tuneo; and Yamaguchi, Tetsuo, to Tokyo Shibaura Electric Co., Ltd. Time-setting and displaying mode control circuit for an electronic timepiece. 4,073,131, Cl. 58-23.00R.

Takase, Yuuzo: *See—*
Soga, Mitsuo; Takase, Yuuzo; Ishikawa, Manabu; Nakazawa, Masahiko; and Nakayama, Mutumi, 4,074,034, Cl. 526-56.000.

Takasugi, Kazuo, to Hitachi, Ltd. Detecting circuit. 4,074,335, Cl. 361-87.000.

Takata, Sinya: *See—*
Otsuki, Tatsukiyo; and Takata, Sinya, 4,073,878, Cl. 423-633.000.

Takeda Chemical Co., Ltd.: *See—*
Kawamatsu, Yutaka; Saraie, Takahiro; Imamiya, Eiko; and Hamuro, Yukihiko, 4,074,057, Cl. 560-55.000.

Takeda Chemical Industries, Ltd.: *See—*
Fujino, Masahiko; Wakimasu, Mitsuhiro; Taketomi, Shigehisa; and Ishikawa, Eiichiro, 4,073,890, Cl. 424-177.000.

Takeda, Nobuhiro; Hattori, Masaichi; Kondo, Minoru; and Kato, Tatsuo, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Brake malfunction warning and indicating system for automobiles. 4,074,226, Cl. 340-52.00B.

Takeda, Shuichi: *See—*
Ookawa, Taro; and Takeda, Shuichi, 4,073,093, Cl. 49-381.000.

Taketomi, Shigehisa: *See—*
Fujino, Masahiko; Wakimasu, Mitsuhiro; Taketomi, Shigehisa; and Ishikawa, Eiichiro, 4,073,890, Cl. 424-177.000.

Takeuchi, Akihiro: *See—*
Asai, Kiyokazu; and Takeuchi, Akihiro, 4,074,152, Cl. 310-334.000.

Takeuchi, Seiji; Fujita, Kazunori; and Shimokobe, Ikuo, to Hitachi, Ltd. Method and apparatus for liquid chromatography under elevated pressure. 4,073,725, Cl. 210-31.00C.

Takeuchi, Takashi: *See—*
Ohtani, Naoteru; Koyama, Tutomu; Takeuchi, Takashi; Azuma, Toshihiro; and Matsuda, Morio, 4,073,658, Cl. 106-92.000.

Takeuchi, Toru: *See—*
Kiyokawa, Shin; Sakaguchi, Shokichi; and Takeuchi, Toru, 4,074,222, Cl. 338-212.000.

Takeuchi, Yasuhisa; Maio, Kenji; and Matsumoto, Junichiro, to Nissan Motor Company, Limited; and Hitachi, Ltd. Vehicle brake controlling device for anti-skid control of vehicle wheels. 4,073,545, Cl. 303-109.000.

Tallman, John F.: *See—*
Pert, Candace B.; Pert, Agu; and Tallman, John F., 4,073,885, Cl. 424-101.000.

Tamagaki, Yoshiteru: *See—*
Kishitani, Masatoshi; Tamagaki, Yoshiteru; Matsumoto, Takeji; Sugimoto, Mikio; and Namiki, Noriaki, 4,073,152, Cl. 61-63.000.

Tamao, Yoshikuni: *See—*
Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Okamoto, Shosuke; and Hijikata, Akiko, 4,073,914, Cl. 424-267.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,913, Cl. 424-267.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,916, Cl. 424-267.000.

Tamao, Yoshikuno: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,891, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,892, Cl. 424-177.000.

Tanaka, Akira: *See—*
Yamada, Shoji; Tanaka, Akira; Horii, Shoichi; and Yamashita, Kiyoshi, 4,073,651, Cl. 96-100.00R.

Tanaka, Hiroo: *See—*
Senju, Ryoichi; and Tanaka, Hiroo, 4,073,689, Cl. 195-63.000.

Tanaka, Hitoshi: *See—*
Masumura, Hitoshi; Fujiwara, Shinobu; and Tanaka, Hitoshi, 4,073,846, Cl. 264-65.000.

Tanaka, Kozo: *See—*
Saji, Yasuo; Kurioka, Hideo; Tanaka, Kozo; and Ogawa, Hiroyasu, 4,073,870, Cl. 423-447.600.

Tanaka, Yoshiaki: *See—*
Handa, Susumu; Tanaka, Yoshiaki; Nishihata, Atsushi; Ueda, Sadashi; Inamoto, Yoshiaki; Tanimoto, Fumio; and Kitano, Hisao, 4,074,052, Cl. 544-221.000.

Tango, Hiroyuki: *See—*
Kimura, Minoru; Tango, Hiroyuki; and Ohmori, Yukio, 4,073,055, Cl. 29-583.000.

Tanimoto, Fumio: *See—*
Handa, Susumu; Tanaka, Yoshiaki; Nishihata, Atsushi; Ueda, Sadashi; Inamoto, Yoshiaki; Tanimoto, Fumio; and Kitano, Hisao, 4,074,052, Cl. 544-221.000.

Tanner Electronic Systems: *See—*
Tanner, James L.; and Rist, Bruno A., 4,074,311, Cl. 358-118.000.

Tanner, Herbert: *See—*
Bertram, Heidrun; Fahnenstich, Rudolf; Offermanns, Heribert; and Tanner, Herbert, 4,073,945, Cl. 426-2.000.

Tanner, James L.; and Rist, Bruno A., to Tanner Electronic Systems. Television security system. 4,074,311, Cl. 358-118.000.

Tanno, Kiyohiko: *See—*
Kojima, Yasuyuki; Tanno, Kiyohiko; Doi, Tetsuo; and Ono, Kunio, 4,074,280, Cl. 346-76.00R.

Tarbell, Harlan E.: *See—*
Raabe, Paul J.; and Tarbell, Harlan E., 4,073,673, Cl. 156-244.000.

Tarrson, Emanuel B.; Tisma, Steven; and Ritch, Donald, to John O. Butler Company. Thread storage and dispensing system. 4,073,419, Cl. 225-44.000.

Taub, Howard Hyman: *See—*
Lane, Ramon; and Taub, Howard Hyman, 4,074,277, Cl. 346-75.000.

Taylor, David L. Customized putter. 4,073,492, Cl. 273-80.200.

Taylor, Henry James; and Ibbotson, Philip Nicholas Peter, to Spar Aerospace Products Limited. Powered wrist joint. 4,073,201, Cl. 74-665.00L.

TDK Electronics Co., Ltd.: *See—*
Masumura, Hitoshi; Fujiwara, Shinobu; and Tanaka, Hitoshi, 4,073,846, Cl. 264-65.000.

Teac Corporation: *See—*
Sakai, Yoshiaki; and Murayama, Kuniki, 4,074,325, Cl. 360-39.000.

Teeny, Parry S.: *See—*
Teeny, Samuel J.; and Teeny, Parry S., 4,073,261, Cl. 118-16.000.

Teeny, Samuel J.; and Teeny, Parry S. Article moistener. 4,073,261, Cl. 118-16.000.

Teijin Limited: *See—*
Akito, Eiichiro; Nakajima, Yoshiyuki; and Horioka, Masayoshi, 4,073,931, Cl. 424-298.000.
Arakawa, Tamio, 4,073,857, Cl. 264-291.000.

Teitin Limited: *See—*
Kouzai, Keiji; Tabe, Yutaka; Masunaga, Eiji; and Matsuda, Kichiro, 4,073,837, Cl. 264-38.000.

Teledyne Industries, Inc.: *See—*
Icenbice, Phineas J., Jr., 4,074,230, Cl. 340-146.1BE.

Telefonaktiebolaget L M Ericsson: *See—*
Eidsmo, Arne; and Lofmark, Bengt Gustav, 4,074,073, Cl. 179-15.0BP.
Forsberg, Gunnar Stefan, 4,074,207, Cl. 331-1.00A.

Telejector Ltd.: *See—*
Cammilleri, Angelo M., 4,074,322, Cl. 358-237.000.

Teply, Milos: *See—*
Forman, Ladislav; Mergl, Milos; Mostecky, Jiri; Teply, Milos; and Uher, Jiri, 4,073,688, Cl. 195-49.000.

Teramae, Akira; Yamada, Koji; and Kawasaki, Hironobu, to Nippon Steel Corporation. Topcoated phosphated bolts, nuts and washers. 4,074,011, Cl. 428-422.000.

Teshima, Soichi: *See—*
Murakami, Fumiki; Teshima, Soichi; and Yokoyama, Toshihiko, 4,074,062, Cl. 560-217.000.

Testline Instruments, Inc.: *See—*
Boatman, Roger M.; and Hall, Melvin R., 4,074,188, Cl. 324-52.000.

Teumer, Roger G.; Warter, Peter J., Jr.; Squassoni, Gino F.; Tulagin, Vseevolod; and Egnaczak, Raymond K., to Xerox Corporation. Photoelectrophoretic heat and pressure transfer mechanism. 4,073,583, Cl. 355-3.00P.

Texaco Inc.: *See—*
Harnsberger, Bobby G., 4,073,342, Cl. 166-295.000.
Harnsberger, Bobby G., 4,073,343, Cl. 166-295.000.
McGann, Rodney, 4,073,832, Cl. 261-118.000.
Seguin, Ronald D.; and Raymond, Douglas D., 4,073,154, Cl. 61-86.000.

Texas Instruments Incorporated: *See—*
Boone, Gary W.; and Cochran, Michael J., 4,074,351, Cl. 364-200.000.
Breazeale, Billy H., 4,073,969, Cl. 427-75.000.
Keough, Laurence J.; and Butts, Bruce D., 4,074,088, Cl. 200-5.00A.
Tubbs, Graham S., 4,074,355, Cl. 364-200.000.

Tezuka, Tohru: *See—*
Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Okamoto, Shosuke; and Hijikata, Akiko, 4,073,914, Cl. 424-267.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,891, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,892, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,913, Cl. 424-267.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,916, Cl. 424-267.000.

Thiokol Corporation: *See—*
Wagner, William F., 4,073,242, Cl. 110-8.00R.

Thom, Karl-Friedrich: *See—*
Moretto, Hans-Heinrich; de Montigny, Armand; Thom, Karl-Friedrich; and Schliebs, Reinhard, 4,073,801, Cl. 260-448.20E.

Thom, Richard S.: *See—*
De brey, Robert J.; and Thom, Richard S., 4,073,533, Cl. 294-118.000.

Thomas, Marion V. Railroad warning signal device. 4,073,453, Cl. 246-125.000.

Thomas, Roy, to International Computers Ltd. Data storage and retrieval systems. 4,074,235, Cl. 364-900.000.

Thompson, Malcolm J.; Feldmesser, Julius; and Robbins, William E., to United States of America, Agriculture. Control of nematodes and other helminths employing certain amides. 4,073,939, Cl. 424-320.000.

Thomson-CSF: *See—*
Charransol, Pierre; Hauri, Jacques; and Athenes, Claude, 4,074,077, Cl. 179-15.0AT.
Epsztein, Bernard; and Kantorowicz, Gerard, 4,074,213, Cl. 333-71.000.
Favreau, Michel; and Vidal, Serge, 4,073,586, Cl. 355-20.000.

Thorberg, Seth Olov: *See—*
Lindberg, Ulf Henrik Anders; Ross, Svante Bertil; Thorberg, Seth Olov; and Ogren, Sven Ove, 4,073,941, Cl. 424-324.000.

Thorton-Trump, Walter Edmond. Conversion package for aircraft de-icing machines. 4,073,437, Cl. 239-131.000.

Tiemeijer, Robert, to U.S. Philips Corporation. Electronic switching signal generator for use in television. 4,074,316, Cl. 358-181.000.

Tien, Ping King: *See—*
Ballman, Albert Anthony; Brown, Harold; Martin, John Martin; and Tien, Ping King, 4,073,675, Cl. 156-600.000.

Tierney, Timothy P., to Raymond Lee Organization, Inc., The. Security step or stop for slidable door. 4,073,522, Cl. 292-262.000.

TII Corporation: *See*—
Simokat, Frank L., 4,074,338, Cl. 361-129.000.
Timpe, Wolfgang: *See*—
Salzmann, Theodor; Timpe, Wolfgang; and Weibelzahl, Manfred, 4,074,348, Cl. 363-160.000.
Tinholt, Thomas H., to Eaton Corporation. Viscous fan drive assembly arrangement. 4,073,370, Cl. 192-58.00B.
Tisma, Steven: *See*—
Tarrson, Emanuel B.; Tisma, Steven; and Ritch, Donald, 4,073,419, Cl. 225-44.000.
Titmus Eurocon Kontaktlinsen KG: *See*—
Hofer, Peter, 4,073,577, Cl. 351-160.000.
T'Jampens, Germain Remi, to U.S. Philips Corporation. Halogen incandescent lamp whose filler gas comprises bromine, chlorine and hydrogen. 4,074,168, Cl. 313-222.000.
Toho Beslon Co., Ltd.: *See*—
Saji, Yasuo; Kurioka, Hideo; Tanaka, Kozo; and Ogawa, Hiroyasu, 4,073,870, Cl. 423-447.600.
Tokai Seiki Co., Ltd.: *See*—
Nitta, Tomio, 4,073,612, Cl. 431-126.000.
Tokura, Yoichi; and Hashimoto, Shinichiro, to Nippon Telegraph & Telephone Public Corporation. Method and apparatus for judging voiced and unvoiced conditions of speech signal. 4,074,069, Cl. 179-1.0SC.
Tokyo Shibaura Electric Co., Ltd.: *See*—
Kuge, Katutaro, 4,074,174, Cl. 318-197.000.
Takase, Tuneo; and Yamaguchi, Tetsuo, 4,073,131, Cl. 58-23.00R.
Tolan, John R., to Milliken Research Corporation. Pull roll apparatus. 4,073,420, Cl. 226-42.000.
Tom McGuane Industries, Inc.: *See*—
Burgess, Ronald R., 4,073,272, Cl. 123-103.00B.
Tomsky, Harry W.: *See*—
Parke, Harry G.; and Tomsky, Harry W., 4,074,176, Cl. 318-371.000.
Tonomura, Shinji: *See*—
Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Okamoto, Shosuke; and Hijikata, Akiko, 4,073,914, Cl. 424-267.000.
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Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,916, Cl. 424-267.000.
Topham, Silas Charles: *See*—
Stanley, James Robert; and Topham, Silas Charles, 4,073,294, Cl. 128-278.000.
Toplak, Ernst: *See*—
Haditsch, Werner; Rutz, Hansruedi; and Toplak, Ernst, 4,074,155, Cl. 310-59.000.
Toray Industries, Inc.: *See*—
Okasaka, Hotsuma; Nakamura, Kiyokazu; Morikawa, Masanobu; Tsunashima, Kenji; and Soda, Atsuhiko, 4,073,827, Cl. 260-835.000.
Torelli, Vesperto: *See*—
Poittevin, Andre; and Torelli, Vesperto, 4,073,919, Cl. 424-270.000.
Torikai, Eiichi; and Kawami, Youji, to Agency of Industrial Science & Technology. Method for treating used or exhausted photographic fixing solution. 4,073,705, Cl. 204-92.000.
Tornabene, Michael G. Wave-action power apparatus. 4,073,142, Cl. 60-502.000.
Torrington Company, The: *See*—
DeBisschop, James George, 4,073,162, Cl. 64-17.00R.
Torza, Sergio: *See*—
Albarino, Robert Vincent; and Torza, Sergio, 4,073,974, Cl. 427-163.000.
Tothero, Dwight L.: *See*—
Abendschein, Frederic Henry; Ivey, John Saxon; Roberts, Richard W.; and Tothero, Dwight L., 4,073,603, Cl. 417-222.000.
Totsu, Katsuyuki. Screw. 4,073,210, Cl. 85-45.000.
Townsend, Richard F. Adjustable volume measuring cup. 4,073,192, Cl. 73-429.000.
Toyo Cloth Co., Ltd.: *See*—
Okabe, Kenji, 4,073,984, Cl. 427-444.000.
Toyo Ink Manufacturing Co., Ltd.: *See*—
Otsuki, Akira; and Nishino, Makoto, 4,073,835, Cl. 264-22.000.
Toyoda-Koki Kabushiki-Kaisha: *See*—
Asaeda, Toshio; Suzuki, Ikuo; Imai, Tomoyasu; Kitajima, Masato; and Hota, Kazunori, 4,073,281, Cl. 125-11.0CD.
Toyomoto, Isao: *See*—
Nakayama, Yasuharu; Watanabe, Tadashi; Yamashita, Yoshio; Aihara, Tetsuo; and Toyomoto, Isao, 4,073,758, Cl. 260-23.0EP.
Toyota Chuo Kenkyusho: *See*—
Fujikake, Kenji; Amaki, Isamu; and Suzuki, Masatoshi, 4,073,338, Cl. 165-86.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Hashimoto, Kametaro; Ushitani, Kenji; Serino, Yoichi; and Arakawa, Tadaoki, 4,073,474, Cl. 251-368.000.
Hayashi, Minoru; Ogino, Mineo; Kobayashi, Toshihiko; and Noda, Masaki, 4,074,090, Cl. 200-19.0DR.
Traverse City Iron Works: *See*—
Royce, John H., 4,073,307, Cl. 137-283.000.
Tree Guying Systems, Inc.: *See*—
Lucia, Angelo Peter, 4,073,090, Cl. 47-43.000.
Trippel, Gerhard, to International Business Machines Corporation. Magnetic record carrier. 4,074,016, Cl. 428-626.000.
Trippi, Anthony C. Bypass dispenser unit for automatic ice maker. 4,073,159, Cl. 62-340.000.
Trostmann, Erik; and Albertsen, Ove, to A/S Daloon. Method for the production of rolled foods products. 4,073,953, Cl. 426-297.000.
Troup, George: *See*—
Hansen, Arne; and Troup, George, 4,073,464, Cl. 251-26.000.
Troxler, Franz; and Wiskott, Erik, to Sandoz Ltd. Isoquinoline compounds. 4,073,909, Cl. 424-258.000.
Trozzolo, Anthony Marion: *See*—
Hartless, Ray Lawson; and Trozzolo, Anthony Marion, 4,073,771, Cl. 260-45.9NC.
True, Richard Brownell, to Litton Systems, Inc. Microwave power combiner. 4,074,265, Cl. 343-18.00E.
TRW Inc.: *See*—
Shoup, Thomas E.; and Spisak, Steve, 4,074,103, Cl. 219-98.000.
Tsuchimoto, Koji: *See*—
Yamaki, Naoomi; Futsuhara, Natsuko; Masuda, Kazue; and Tsuchimoto, Koji, 4,073,866, Cl. 423-405.000.
Tsuchiya, Yoshimasa; and Fujii, Hiroshi, to Nissan Motor Company, Limited. Latch mechanism. 4,073,520, Cl. 292-216.000.
Tsuchiya, Yoshimasa: *See*—
Miyabayashi, Yoshiyuki; and Tsuchiya, Yoshimasa, 4,073,170, Cl. 70-256.000.
Tsunashima, Kenji: *See*—
Okasaka, Hotsuma; Nakamura, Kiyokazu; Morikawa, Masanobu; Tsunashima, Kenji; and Soda, Atsuhiko, 4,073,827, Cl. 260-835.000.
Tsuruzawa, Teruya; and Ueda, Muneyuki, to Nippon Seal Co., Ltd. Cleaning brush. 4,073,027, Cl. 15-172.000.
Tsutsui, Seiko: *See*—
Kishi, Hidehiro; Harakawa, Hiroshi; Ogawa, Kazuo; and Tsutsui, Seiko, 4,073,782, Cl. 260-23.00H.
Tsuyuguchi, Michio: *See*—
Kiritani, Yoshio; Tsuyuguchi, Michio; Ibaragi, Tetsuo; Yano, Katsuhiro; Sunami, Yoshihiko; Nishioka, Kunihiko; and Sumikin Coke Company Limited, 4,073,625, Cl. 44-10.00R.
Tubbs, Graham S., to Texas Instruments Incorporated. Digital microprocessor system with shared decode. 4,074,355, Cl. 364-200.000.
Tuchman, Walter Leonard: *See*—
Ehrsam, William Friedrich; Meyer, Carl H. W.; Smith, John Lynn; and Tuchman, Walter Leonard, 4,074,066, Cl. 178-22.000.
Tuft, Roy E.: *See*—
Strong, Herbert M.; and Tuft, Roy E., 4,073,380, Cl. 206-219.000.
Tulagin, Vseevolod: *See*—
Teumer, Roger G.; Warter, Peter J., Jr.; Squassoni, Gino F.; Tulagin, Vseevolod; and Egnaczak, Raymond K., 4,073,583, Cl. 355-3.00P.
Tuller, Harold W.; and Nussbaum, Ralph W., to Allied Chemical Corporation. Production of low molecular weight polyanhydrides. 4,074,036, Cl. 526-238.000.
Tunemoto, Daiei: *See*—
Kondo, Kiyoshi; Tunemoto, Daiei; and Hiro, Etsuko, 4,073,799, Cl. 260-345.80P.
Turbo Engineering Corporation: *See*—
Rodler, Waldo E., Jr., 4,073,257, Cl. 115-12.00R.
Turkowski, Lukasz: *See*—
Ostrowski, Jerzy; Sierputowski, Piotr; Turkowski, Lukasz; Jablkiewicz, Jerzy; Pacholski, Jan; and Jedryka, Tadeusz, 4,073,128, Cl. 57-58.890.
Ostrowski, Jerzy; Sierputowski, Piotr; Turkowski, Lukasz; Jablkiewicz, Jerzy; Pacholski, Jan; and Jedryka, Tadeusz, 4,073,129, Cl. 57-58.890.
Turnbull, Fred G., to General Electric Company. Method and apparatus for measuring the speed of a rotating shaft. 4,074,339, Cl. 361-239.000.
Tyson, Charles P.: *See*—
George, Jimmie; and Tyson, Charles P., 4,073,508, Cl. 280-478.00R.
UBE Industries, Ltd.: *See*—
Kishi, Hidehiro; Harakawa, Hiroshi; Ogawa, Kazuo; and Tsutsui, Seiko, 4,073,782, Cl. 260-23.00H.
Uchida, Isamu, to Laurel Bank Machine Co., Ltd. Device for detecting the thickness of sheets. 4,073,488, Cl. 271-263.000.
Uchiike, Hisayuki: *See*—
Nakagawa, Mutsuaki; Wakasa, Yutaka; Uchiike, Hisayuki; and Nagata, Susumu, 4,074,354, Cl. 364-200.000.
Ueda, Hiroshi; and Yoshizaki, Akira, to Minolta Camera Kabushiki Kaisha. Single lens reflex camera with automatic exposure control mechanism. 4,074,291, Cl. 354-51.000.
Ueda, Masanobu, to Dainichi Kinzoku Kogyo Co., Ltd. Method and a system of numerically controlling a cutting machine. 4,074,349, Cl. 364-107.000.
Ueda, Muneyuki: *See*—
Tsuruzawa, Teruya; and Ueda, Muneyuki, 4,073,027, Cl. 15-172.000.
Ueda, Sadashi: *See*—
Handa, Susumu; Tanaka, Yoshiaki; Nishihata, Atsushi; Ueda, Sadashi; Inamoto, Yoshiaki; Tanimoto, Fumio; and Kitano, Hisao, 4,074,052, Cl. 544-221.000.
Ueltz, Herbert F. G.; Dashineau, Melvin A.; and Pino, James J., to U.S.

Industries, Inc. Process for the manufacture of abrasive material. 4,073,096, Cl. 51-309.00A.
Uematsu, Takashi: *See—*
Kogo, Hiroshi; Kato, Tokuji; and Uematsu, Takashi, 4,074,317, Cl. 358-181.000.
Uher, Jiri: *See—*
Forman, Ladislav; Mergl, Milos; Mostecky, Jiri; Teply, Milos; and Uher, Jiri, 4,073,688, Cl. 195-49.000.
Ullrich, Hansjurgen; Dippel, Heinz; and Loss, Karl, to Dr. C. Otto & Comp. G.m.b.H. Process for treating flushing liquor. 4,073,728, Cl. 210-71.000.
Ultra Centrifuge Nederland N.V.: *See—*
Visser, Kommer, 4,073,710, Cl. 204-129.650.
Umeda, Junichi: *See—*
Aiki, Kunio; Nakamura, Michiharu; and Umeda, Junichi, 4,073,676, Cl. 156-624.000.
Underwood, Gene E., to Occidental Oil Shale, Inc. Raise bore drilling machine. 4,073,352, Cl. 175-53.000.
Union Carbide Corporation: *See—*
Flanigen, Edith Marie; and Patton, Robert Lyle, 4,073,865, Cl. 423-339.000.
Kurtz, Arthur Peter, Jr.; and D'Silva, Themistocles D. J., 4,073,930, Cl. 424-277.000.
Urry, Lewis Frederick, 4,074,023, Cl. 429-56.000.
Union Oil Company of California: *See—*
Young, Donald C., 4,073,633, Cl. 71-28.000.
Uniroyal, Inc.: *See—*
Allard, Claude H., 4,073,330, Cl. 152-361.0DM.
Unistrut Corporation: *See—*
Irish, Elwood, 4,073,114, Cl. 52-710.000.
United Chemical Corporation: *See—*
Van Cleave, Jon Stephen, 4,073,983, Cl. 427-421.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the: *See—*
Cunningham, Sinclair Upton; and Jackson, Douglas, 4,073,247, Cl. 112-121.120.
United States Filter Corporation: *See—*
Reinauer, Thomas V.; Duyckinck, Robert W.; and Handwork, Frank B., 4,073,632, Cl. 55-374.000.
U.S. Industries, Inc.: *See—*
Snyder, David E., 4,073,466, Cl. 251-63.400.
Ueltz, Herbert F. G.; Dashineau, Melvin A.; and Pino, James J., 4,073,096, Cl. 51-309.00A.
United States of America
Agriculture: *See—*
Bailey, August V.; Boudreaux, Gordon J.; Sumrell, Gene; and Novak, Arthur F., 4,074,058, Cl. 560-105.000.
Popper, Karel; Camirand, Wayne M.; Williams, Gerald S.; and Mecchi, Edward P., 4,073,747, Cl. 252-412.000.
Thompson, Malcolm J.; Feldmesser, Julius; and Robbins, William E., 4,073,939, Cl. 424-320.000.
Army: *See—*
Bates, Calvin Dwight, 4,074,211, Cl. 333-31.00R.
Sullivan, Albert M., Jr., 4,074,263, Cl. 343-6.8LC.
Energy: *See—*
Huston, John L.; Scott, Robert G.; and Studier, Martin H., 4,073,624, Cl. 44-1.00R.
Kelley, George G., 4,073,680, Cl. 176-3.000.
Morgan, Chester S., 4,073,647, Cl. 75-235.000.
Whisman, Marvin L.; Reynolds, James W.; Goetzinger, John W.; and Cotton, Faye O., 4,073,719, Cl. 208-180.000.
Whisman, Marvin L.; Goetzinger, John W.; and Cotton, Faye O., 4,073,720, Cl. 208-180.000.
Health, Education and Welfare: *See—*
Pert, Candace B.; Pert, Agu; and Tallman, John F., 4,073,885, Cl. 424-101.000.
Willson, Robert D.; and Henderson, Terry L., 4,073,194, Cl. 73-646.000.
Navy: *See—*
Brown, R. Bernard, 4,073,590, Cl. 356-209.000.
Kaloi, Cyril M., 4,074,270, Cl. 343-700.0MS.
Knox, Sidney G., 4,074,267, Cl. 343-106.00R.
Kranz, Paul, 4,074,241, Cl. 340-189.00M.
San Miguel, Anthony, 4,073,985, Cl. 428-35.000.
Steen, Donald B., 4,074,099, Cl. 200-153.00S.
U.S. Philips Corporation: *See—*
Brewer, Robert J., 4,074,302, Cl. 357-24.000.
Clarke, John Alfred; and Howden, Harry, 4,073,574, Cl. 350-189.000.
de Jager, Frank; and Martony, Juan Jose, 4,074,199, Cl. 325-50.000.
Garskamp, Arnoldus, 4,074,216, Cl. 334-15.000.
Harms, Arie Anthonie; and Wark, Johan Gerrit, 4,074,189, Cl. 324-73.00R.
Jagers, Henricus P.; and Sanders, Rudolf, 4,074,121, Cl. 362-13.000.
Janssen, Johannes Hendrikus Hubertus, 4,074,173, Cl. 318-138.000.
Lakerveld, Herman Gerard; and van Rosmalen, Gerard Eduard, 4,073,567, Cl. 350-6.500.
Naaijer, Geert Jan, 4,074,149, Cl. 307-351.000.
Schroder, Gerd, 4,073,432, Cl. 235-92.0FQ.
Stevens, Petrus Franciscus, 4,074,135, Cl. 250-366.000.
Tiemeijer, Robert, 4,074,316, Cl. 358-181.000.
T'Jampens, Germain Remi, 4,074,168, Cl. 313-222.000.
van den Broek, Cornelis Pieter; and van Lieshout, Johannes Maria Josephus, 4,074,167, Cl. 313-222.000.
van der Gaag, Hendrik, 4,074,261, Cl. 340-365.00R.
van der Leeuw, Bart, 4,074,163, Cl. 313-13.000.
van Rosmalen, Gerard Eduard, 4,074,312, Cl. 358-128.000.
Velzel, Christiaan Hendrik Frans; and Greve, Peter Ferdinand, 4,074,314, Cl. 358-128.000.
Wesselink, Gustaaf Adolf; Roelofs, Hendrik; and Ponsen, Gijsbert Johannes, 4,074,172, Cl. 315-307.000.
Woodworth, Frederick Arthur; and Zobel, Ernst-Guenther, 4,074,171, Cl. 315-241.00P.
United States Shoe Corporation, The: *See—*
Stix, Nathan, 4,073,024, Cl. 12-142.00J.
United Technologies Corporation: *See—*
Duvall, David S.; Owczarski, William A.; Paulonis, Daniel F.; and Schaefer, Robert P., 4,073,639, Cl. 75-.50R.
Messman, Leonard A.; Wooding, Harold C., Jr.; and Waehner, Glenn C., 4,074,130, Cl. 250-223.00R.
Roberts, Richard, 4,073,137, Cl. 60-39.320.
University of Illinois Foundation: *See—*
Long, David M., Jr., 4,073,879, Cl. 424-5.000.
University of Toledo, The: *See—*
Zrudsky, Donald R., 4,074,076, Cl. 179-15.0BL.
UOP Inc.: *See—*
Vora, Bipin V., 4,073,823, Cl. 260-683.480.
Upjohn Company, The: *See—*
Axen, Udo F., 4,073,803, Cl. 260-515.00A.
Evenson, Gerald Norman; and Moffett, Robert Bruce, 4,073,785, Cl. 260-243.300.
Moffett, Robert Bruce, 4,073,784, Cl. 260-243.300.
Nelson, Norman A., 4,073,805, Cl. 260-590.00C.
Nelson, Norman A., 4,073,808, Cl. 260-563.00R.
Urban, Friedrich: *See—*
Oeder, Dieter; Gropper, Hans; and Urban, Friedrich, 4,074,040, Cl. 526-352.000.
Urry, Lewis Frederick, to Union Carbide Corporation. Primary dry cell with masked separator. 4,074,023, Cl. 429-56.000.
Ushio, Hiroyuki: *See—*
Atsukawa, Masumi; Ushio, Hiroyuki; Kuwabara, Haruo; and Kubo, Kyoji, 4,073,864, Cl. 423-242.000.
Ushitani, Kenji: *See—*
Hashimoto, Kametaro; Ushitani, Kenji; Serino, Yoichi; and Arakawa, Tadaoki, 4,073,474, Cl. 251-368.000.
Utility Products, Inc.: *See—*
Wright, Allen C., 4,073,367, Cl. 182-204.000.
Vacik, Jiri: *See—*
Lim, Draholav; Kopecek, Jindrich; Bazilova nee Sverinova, Hedvika; and Vacik, Jiri, 4,074,039, Cl. 526-303.000.
Valcavi, Umberto, to Istituto Biochimico Italiano di Loredana Lorenzini S.a.s.; and Dr. Madaus & Co. 19,20-Bis-nor-prostenoic acids as hypolipemic compounds. 4,073,938, Cl. 424-317.000.
Valentine, Donald, Jr.: *See—*
Batcho, Andrew David; Hengartner, Urs Oskar; Leimgruber, Willy; Scott, John William; and Valentine, Donald, Jr., 4,073,795, Cl. 260-326.14T.
Valentine, Donald Herman, Jr.: *See—*
Leimgruber, Willy; and Valentine, Donald Herman, Jr., 4,073,811, Cl. 260-611.00A.
Van Alstine Audio Systems, Inc.: *See—*
Broburg, Gregory W.; and Clark, Allen C., 4,074,204, Cl. 330-109.000.
van Cappelle, Hendrik Cornelis, to Hoogovens Ijmuiden, BV. Ship loading system. 4,073,390, Cl. 214-14.000.
Vance, Christopher John: *See—*
Fleischmann, Martin; Goodridge, Francis; and Vance, Christopher John, 4,073,702, Cl. 204-59.00R.
Van Cleave, Jon Stephen. Preventive treatment for Otitis Externae. 4,073,937, Cl. 424-312.000.
Van Cleave, Jon Stephen, to United Chemical Corporation. Method and composition for decreasing water resistance to movement. 4,073,983, Cl. 427-421.000.
van den Berg, Johannes Cornelis Maria. Method and apparatus for receiving sound intended for stereophonic reproduction. 4,074,084, Cl. 179-100.1TD.
van den Bosch, Steven, to P.F.W. Beheer B.V. Spiro-1,2,4-trithiolan containing flavoring agents and method of use. 4,073,957, Cl. 426-535.000.
van den Broek, Cornelis Pieter; and van Lieshout, Johannes Maria Josephus, to U. S. Philips Corporation. Halogen incandescent lamp. 4,074,167, Cl. 313-222.000.
van der Gaag, Hendrik, to U.S. Philips Corporation. Keyboard contact and signal line arrangement. 4,074,261, Cl. 340-365.00R.
van der Leeuw, Bart, to U.S. Philips Corporation. Discharge lamp with heat shield. 4,074,163, Cl. 313-13.000.
van der Lely, Cornelis; and Nieuwenhoven, Hendricus Jacobus Cornelis. Roofing of buildings. 4,073,099, Cl. 52-69.000.
Van der Schoot, Martinus R., to Westinghouse Electric Corporation. Boron control system for a nuclear power plant. 4,073,683, Cl. 176-86.00L.
Vandeweghe, Joseph L., to Engleway Corporation. Emergency detection alarm and evacuation system. 4,074,225, Cl. 340-237.00R.
Van Hoose, Fred C.: *See—*
Gordon, Steven R., 4,073,475, Cl. 254-66.000.
van Lieshout, Johannes Maria Josephus: *See—*
van den Broek, Cornelis Pieter; and van Lieshout, Johannes Maria Josephus, 4,074,167, Cl. 313-222.000.
van Rosmalen, Gerard Eduard, to U.S. Philips Corporation. Automatic dithering optical focusing system using an oscillating mirror in the path of the radiation beam. 4,074,312, Cl. 358-128.000.

van Rosmalen, Gerard Eduard: *See—*
Lakerveld, Herman Gerard; and van Rosmalen, Gerard Eduard, 4,073,567, Cl. 350-6.500.

Vassallo, Alphonse C. Parts cleaner. 4,073,029, Cl. 15-302.000.

Vector General, Inc.: *See—*
Hasenbalg, Ralph D., 4,074,359, Cl. 364-521.000.

Veeder Industries, Inc.: *See—*
Schiller, Robert J.; and Perrill, Theodore Charles, 4,074,356, Cl. 364-465.000.

Veitscher Magnesitwerke-Actien-Gesellschaft: *See—*
Gulas, Hans-Jurgen; and Neuper, Helmut, 4,073,656, Cl. 106-57.000.

Velsicol Chemical Corporation: *See—*
Anderson, Arnold L., 4,073,772, Cl. 260-45.75B.
Stach, Leonard J.; and Wilke, Robert N., 4,073,894, Cl. 424-200.000.

Velzel, Christiaan Hendrik Frans; and Greve, Peter Ferdinand, to U.S. Philips Corporation. Apparatus for optically reading a record carrier and correcting focus error. 4,074,314, Cl. 358-128.000.

Vensel, James E.: *See—*
Keslar, Leroy D.; and Vensel, James E., 4,073,986, Cl. 428-38.000.

Vian, David Roy; and Price, Stephen Glenn, to Hayden Trans-Cooler, Inc. Quick connect device for auto radiators. 4,073,512, Cl. 285-12.000.

Vidal, Serge: *See—*
Favreau, Michel; and Vidal, Serge, 4,073,586, Cl. 355-20.000.

Vilenski, Dan: *See—*
Kulicke, Frederick W., Jr.; Soffa, Albert; Vilenski, Dan; and Brockmann, Asher, 4,073,424, Cl. 228-4.500.

Virving, Nils G., to Defibrator Aktiebolag. Electrically controlled system for regulating the grinding space in a grinding apparatus. 4,073,442, Cl. 241-37.000.

Viscosuisse SA: *See—*
Reufer, Christian, 4,073,421, Cl. 226-97.000.

Visser, Kommer, to Ultra Centrifuge Nederland N.V. Method of machining electrically conducting substances by electrochemical attack. 4,073,710, Cl. 204-129.650.

Vitramon, Incorporated: *See—*
Leigh, William Conrad, 4,074,340, Cl. 361-321.000.

Vivitar Corporation: *See—*
Orban, Jean M., 4,074,170, Cl. 315-120.000.

Vock, Manfred Hugo: *See—*
Hall, John B.; Sprecker, Mark A.; Schmitt, Frederick Louis; and Vock, Manfred Hugo, 4,073,751, Cl. 252-522.000.

Vofsi, David: *See—*
Cabasso, Israel; Jagur-Grodzinski, Joseph; and Vofsi, David, 4,073,754, Cl. 260-17.00R.

Vogel, James P. Foldable plant support. 4,073,091, Cl. 47-45.000.

Vogt, Harald: *See—*
Wurst, Bert; and Vogt, Harald, 4,073,203, Cl. 74-866.000.

Voith Getriebe KG: *See—*
Armasow, Waldemar; and Lindenthal, Hans, 4,073,139, Cl. 60-357.000.
Dick, Heinrich, 4,073,204, Cl. 74-866.000.

Volin, Timothy Earl; Benjamin, John Stanwood; Larson, Jay Michael; and Cairns, Robert Lacock, to International Nickel Company, Inc., The. Thermoplastic prealloyed powder. 4,073,648, Cl. 75-245.000.

Volkswagenwerk Aktiengesellschaft: *See—*
Danckert, Hermann, 4,073,357, Cl. 180-64.00R.
Sajfert, Drago, 4,073,526, Cl. 292-347.000.

vonBebenburg, Walter; and Offermanns, Heribert, to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler. 5-Aryl-pyrido-(b-6,7)-1,4-diazaepine with an additional fused heterocyclic ring. 4,073,792, Cl. 260-296.00H.

Voos, Frank J.; and Magoulick, David M., to National Distillers and Chemical Corporation. Charge and relief valve. 4,073,312, Cl. 137-877.000.

Vora, Bipin V., to UOP Inc. Alkylation process utilizing HF regenerator stream to a multi-tray main fractionator. 4,073,823, Cl. 260-683.480.

Vorbrueggen, Helmut: *See—*
Skuballa, Werner; Raduechel, Bernd; Vorbrueggen, Helmut; Elger, Walter; Loge, Olaf; and Schillinger, Eckehard, 4,073,934, Cl. 424-305.000.

Voross, Zoltan, to Sun Electric Corporation. Apparatus for measuring the dwell of an automotive ignition system. 4,074,183, Cl. 324-16.00R.

Voss, Joachim. Process for analog/digital conversion. 4,074,259, Cl. 340-347.0AD.

Vysoka skola chemicko-technologicka: *See—*
Forman, Ladislav; Mergl, Milos; Mostecky, Jiri; Teply, Milos; and Uher, Jiri, 4,073,688, Cl. 195-49.000.

W. R. Grace & Co.: *See—*
Hartdegen, Frank Joseph; and Abdo, Kamal Mohammad, 4,073,884, Cl. 424-94.000.

Wacker-Chemie GmbH: *See—*
Wiest, Hubert; Berger, Rainer; and Lieb, Erwin, 4,073,779, Cl. 260-79.3MU.

Wada, Motomu; Inoue, Masakazu; Furukawa, Kazunori; and Matsubara, Shigeyoshi, to Sumitomo Chemical Company, Limited. Preparation of crosslinked polyolefin foams and the mold. 4,073,844, Cl. 264-55.000.

Wada, Tasaku; and Nakabo, Satoru, to Kokusai Denshin Denwa Kabushiki Kaisha. Flying printing system using type belt. 4,074,068, Cl. 178-23.00R.

Wada, Tsutomu: *See—*
Sakai, Tetsushi; Sakakibara, Yutaka; Murota, Junichi; and Wada, Tsutomu, 4,074,300, Cl. 357-23.000.

Waehner, Glenn C.: *See—*
Messman, Leonard A.; Wooding, Harold C., Jr.; and Waehner, Glenn C., 4,074,130, Cl. 250-223.00R.

Wagner, Josef: *See—*
Grill, Helmut; Zschocke, Rainer Hans; Wagner, Josef; Hofrichter, Gernot; and Janiak, P. Stefan, 4,073,935, Cl. 424-308.000.

Wagner, William F., to Thiokol Corporation. Sewage sludge disposal. 4,073,242, Cl. 110-8.00R.

Wahlbeck, Hans Gustav Erik. Method and apparatus for continuously soldering of chains of precious metals or plated therewith. 4,073,428, Cl. 228-178.000.

Wainer, Eugene, to Horizons Incorporated. Continuous channel electron beam multiplier. 4,073,989, Cl. 428-131.000.

Wakabayashi, Takao, to Nakanishi Conveyors Co. Ltd. Power and free conveyor with pusher disengaging means operable on curved sections of conveyor track. 4,073,237, Cl. 104-172.00C.

Wakasa, Yutaka: *See—*
Nakagawa, Mutsuaki; Wakasa, Yutaka; Uchiike, Hisayuki; and Nagata, Susumu, 4,074,354, Cl. 364-200.000.

Wakeman, Alden H.; and Heiliger, Leonard R., to Crepaco, Inc. Rotary pump construction with cleaning feature. 4,073,605, Cl. 417-283.000.

Wakimasu, Mitsuhiro: *See—*
Fujino, Masahiko; Wakimasu, Mitsuhiro; Taketomi, Shigehisa; and Ishikawa, Eiichiro, 4,073,890, Cl. 424-177.000.

Walker, Bruce H.: *See—*
Rowley, David S.; Walker, Bruce H.; Fielder, Coy M.; and Rohde, Heino J., 4,073,354, Cl. 175-329.000.

Walker, Charles M.: *See—*
Crowley, Norman R.; and Walker, Charles M., 4,073,373, Cl. 198-421.000.

Wallace, Edward Morris; and Gosselin, Robert George, to Wallace Mfg. Corporation. Hook style pruning shear. 4,073,059, Cl. 30-261.000.

Wallace Mfg. Corporation: *See—*
Wallace, Edward Morris; and Gosselin, Robert George, 4,073,059, Cl. 30-261.000.

Walling, Jorg-Hein; and Jukes, John Alan, to Northern Telecom Limited. Electrostatic powder coating apparatus. 4,073,265, Cl. 118-634.000.

Walraet, Jean G.: *See—*
Boutmy, Patrick E.; and Walraet, Jean G., 4,074,074, Cl. 179-15.0BW.

Walters, D. F., to Dresser Industries, Inc. Sealing system for a rotary rock bit. 4,073,548, Cl. 308-8.200.

Walters, Donald H. Railing with interfitting rectangular and curved cross section members. 4,073,477, Cl. 256-22.000.

Walton Products, Inc.: *See—*
Reed, Robert T., 4,073,385, Cl. 213-100.00R.

Walworth, Bryant Leonidas: *See—*
Bullock, Milon Walker; and Walworth, Bryant Leonidas, 4,074,059, Cl. 560-135.000.

Walz, Robert A. Method and apparatus for repairing a crack in a pane of plate glass. 4,073,094, Cl. 51-111.00R.

Wang, Jin-Liang; Brown, Melvin; and Menapace, Henry R., to Goodyear Tire & Rubber Company, The. Olefin metathesis process. 4,073,820, Cl. 260-683.00D.

Wang, Joseph Y.: *See—*
Okamoto, Yoshiyuki; Wang, Joseph Y.; and Chou, Eng J., 4,073,726, Cl. 210-45.000.

Wang, Richard H. S.; and Zannucci, Joseph S., to Eastman Kodak Company. Multichromophoric benzotriazole ultraviolet stabilizers and their use in organic compositions. 4,073,745, Cl. 252-403.000.

Ward, Denby Harcourt: *See—*
Lawson, Frank; Ward, Denby Harcourt; and Kelly, Robert George, 4,073,481, Cl. 266-215.000.

Wark, Johan Gerrit: *See—*
Harms, Arie Anthonie; and Wark, Johan Gerrit, 4,074,189, Cl. 324-73.00R.

Warner Electric Brake & Clutch Company: *See—*
Kuo, Benjamin C.; Frus, John R.; and Singh, Gurdial, 4,074,179, Cl. 318-696.000.

Warner-Lambert Company: *See—*
Brown, Richard E., 4,073,789, Cl. 260-293.580.
Zinnes, Harold; Lindo, Neil A.; and Shavel, John, Jr., 4,074,048, Cl. 544-49.000.

Warren Insulated Bloc, Inc.: *See—*
Warren, Millard R., 4,073,111, Cl. 52-407.000.

Warren, Millard R., to Warren Insulated Bloc, Inc. Insulated masonry block. 4,073,111, Cl. 52-407.000.

Warter, Peter J., Jr.: *See—*
Teumer, Roger G.; Warter, Peter J., Jr.; Squassoni, Gino F.; Tulagin, Vseevolod; and Egnaczak, Raymond K., 4,073,583, Cl. 355-3.00P.

Wasag-Chemie AG: *See—*
Kraemer, Stefan; Seger, Michael; and Seidl, Alois, 4,073,729, Cl. 210-80.000.

Wasco Products, Inc.: *See—*
Jentoft, Arthur P.; and Couture, Paul A., 4,073,097, Cl. 52-22.000.

Washizuka, Isamu; Hashimoto, Shintaro; and Katsui, Saburo, to Sharp Kabushiki Kaisha. Calculator construction. 4,074,118, Cl. 364-712.000.

Watanabe, Kenzo: *See*—
Nishikaji, Takashi; Watanabe, Kenzo; and Sawayama, Shigeru, 4,074,041, Cl. 528-488.000.
Watanabe, Kuniyuki, to Nissan Motor Company, Limited. Arrangement of fuel system in motor vehicle. 4,073,360, Cl. 180-104.000.
Watanabe, Kyoichi Aloisius; Chu, Chung Kwang; and Fox, Jack Jay, to Research Corporation. Pseudo-isocytidine. 4,074,042, Cl. 536-1.000.
Watanabe, Tadashi: *See*—
Nakayama, Yasuharu; Watanabe, Tadashi; Yamashita, Yoshio; Aihara, Tetsuo; and Toyomoto, Isao, 4,073,758, Cl. 260-23.0EP.
Waters, John R.: *See*—
Ahnell, Joseph E.; Broman, Rodney L.; and Waters, John R., 4,073,691, Cl. 195-103.50M.
Buda, Dennis; Broman, Rodney L.; and Waters, John R., 4,073,694, Cl. 195-103.700.
Watson, John Graham: *See*—
Aylmer, Norman Noel; Coe, Peter; Watson, John Graham; and Holloway, Brian Percy, 4,073,157, Cl. 61-111.000.
Way, Allan S.; Glenn, Thomas J.; Sloane, Howard J.; and Keahl, Gerald T., to Beckman Instruments, Inc. Spectrophotometer having independently controlled chart scale expansion and chart format selection. 4,074,272, Cl. 346-33.00A.
Webasto-Werk W. Baier GmbH & Co.: *See*—
Schatzler, Walter, 4,073,536, Cl. 296-137.00G.
Webb, Edward A.; Barakitis, Nikolaos; and Pigott, Keith, to GTE Sylvania Incorporated. Ultraviolet emitting arc discharge lamp. 4,074,166, Cl. 313-185.000.
Webb, Paul Dale; and Morse, Henry William, to Ingersoll-Rand Company. Gas compressor system. 4,073,607, Cl. 418-86.000.
Weber, Erich: *See*—
Martin, Johannes Josef; and Weber, Erich, 4,073,480, Cl. 266-201.000.
Weber, Klaus; Ludemann, Heinz; Schubert, Andreas; and Pustka, Karel, to AGFA-Gevaert, A.G. Method and apparatus for assembling and pocketing sections of photographic films. 4,073,118, Cl. 53-23.000.
Weber Marking Systems, Inc.: *See*—
Roser, Gerhard K., 4,073,231, Cl. 101-48.000.
Schick, Margery L.; and Anderson, Bror E., 4,074,003, Cl. 428-341.000.
Weber, Max H.: *See*—
Hunt, Paul S.; Elliott, James P.; Gulich, Johann F.; Weber, Max H.; Yampolsky, Jack S.; and Lockett, George E., 4,073,267, Cl. 122-32.000.
Webster, Douglas G. Speedometer and odometer apparatus. 4,074,196, Cl. 324-166.000.
Weck, Friedrich J.; Hunkins, James; and Rinsler, Samuel J. Newsprint coupon separator. 4,073,982, Cl. 427-270.000.
Weerth, Hans Ernst: *See*—
Muller, Johann; Weerth, Hans Ernst; and Staudenrausch, Georg, 4,073,039, Cl. 17-1.00F.
Weibelzahl, Manfred: *See*—
Salzmann, Theodor; Timpe, Wolfgang; and Weibelzahl, Manfred, 4,074,348, Cl. 363-160.000.
Weinstein, Stephen Brant: *See*—
Falconer, David Duncan; and Weinstein, Stephen Brant, 4,074,086, Cl. 179-170.200.
Weisberg, Alfred M.; and Kroll, Harry. Process for producing by electrodeposition bright deposits of gold and its alloys. 4,073,700, Cl. 204-43.00G.
Weischedel, Richard C., to General Electric Company. Power supply system with parallel regulators and keep-alive circuitry. 4,074,182, Cl. 323-25.000.
Weiss, Martin Joseph: *See*—
Schaub, Robert Eugene; Bernady, Karel Francis; and Weiss, Martin Joseph, 4,074,056, Cl. 560-51.000.
Wej-it Corporation: *See*—
Lerich, Lester, 4,073,212, Cl. 85-79.000.
Wells-Gardner Electronics Corporation: *See*—
Shragal, Robert, 4,074,071, Cl. 179-6.00R.
Welsh, Alan B.: *See*—
Whittington, Billy J.; Welsh, Alan B.; and Burns, Timothy L., 4,073,209, Cl. 84-1.240.
Welsh, Robert C., to Frieder, Phillip M., a part interest. Spectacle lens for aphakia patients. 4,073,578, Cl. 351-167.000.
Welzel, Josef, to Hermann Hemscheidt Maschinenfabrik. Suspended valve control device. 4,073,150, Cl. 61-45.00D.
Wendel, I. L., to Lowe, James L. Fluid handling system. 4,073,285, Cl. 126-271.000.
Werzalit Pressholzwerk J.F. Werz K.G.: *See*—
Munk, Edmund E., 4,073,851, Cl. 264-109.000.
Wessel, Wolf: *See*—
Herth, Harro; Kraus, Bernd; Sautter, Wilfried; and Wessel, Wolf, 4,073,269, Cl. 123-32.0EE.
Wesselink, Gustaaf Adolf; Roelofs, Hendrik; and Ponsen, Gijsbert Johannes, to U.S. Philips Corporation. Discharge lamp operating circuit. 4,074,172, Cl. 315-307.000.
West Electric Co., Ltd.: *See*—
Iwata, Hiroshi; and Yamaoka, Tetsuo, 4,074,287, Cl. 354-31.000.
West Point-Pepperell Inc.: *See*—
Moore, Ricky L.; and Hagborg, Winston E., 4,074,005, Cl. 428-378.000.
West, Richard Lowell: *See*—
Hartmann, Ludwig Albert; and West, Richard Lowell, 4,073,802, Cl. 260-512.00R.
Westdale, Virgil W.; and Novotny, John, to Addressograph Multigraph Corporation. Chemically treated carrier particles for use in electrophotography. 4,073,980, Cl. 428-404.000.
Western Electric Company, Inc.: *See*—
Baron, William James, 4,073,981, Cl. 427-259.000.
Western Skyways, Inc.: *See*—
Draper, Robert N., 4,073,189, Cl. 73-228.000.
Westinghouse Air Brake Company: *See*—
Hart, James E., 4,073,544, Cl. 303-83.000.
Westinghouse Electric Corporation: *See*—
Allen, James M.; and Szewczuk, Thomas M., 4,073,599, Cl. 416-97.00R.
Gupta, Rash B.; and Armstrong, David L., 4,074,357, Cl. 364-494.000.
Riley, John A., 4,074,346, Cl. 363-50.000.
Salvati, John G.; and Skalka, Paul, 4,074,218, Cl. 335-176.000.
Santilli, James N., 4,074,220, Cl. 337-276.000.
Van der Schoot, Martinus R., 4,073,683, Cl. 176-86.00L.
Westvaco Corporation: *See*—
Hammond, Jack A.; and Karter, Elias M., 4,073,678, Cl. 162-19.000.
Wheeler, Richard J. Bottle supported shelf apparatus. 4,073,241, Cl. 108-91.000.
Whisman, Marvin L.; Reynolds, James W.; Goetzinger, John W.; and Cotton, Faye O., to United States of America, Energy. Process for preparing lubricating oil from used waste lubricating oil. 4,073,719, Cl. 208-180.000.
Whisman, Marvin L.; Goetzinger, John W.; and Cotton, Faye O., to United States of America, Energy. Method for reclaiming waste lubricating oils. 4,073,720, Cl. 208-180.000.
Whitaker, Edward. Support device. 4,073,462, Cl. 248-537.000.
White, Alan Chapman; and Black, Robin Michael, to John Wyeth & Brother Limited. Pyrimido[1,2-B]isoquinolines. 4,073,906, Cl. 424-251.000.
Whiteside, George D.: *See*—
Johnson, Bruce K.; and Whiteside, George D., 4,074,288, Cl. 354-33.000.
Whittington, Billy J.; Welsh, Alan B.; and Burns, Timothy L., to Kimball International, Inc. Method and circuitry for digital-analog frequency generation. 4,073,209, Cl. 84-1.240.
Wide, Lars: *See*—
Carlsson, Eric; Gefvert, Karl Ivan; Hjalmarsson, Thomas; Kerff, Anton; Pejchal, Karel; and Wide, Lars, 4,073,450, Cl. 242-131.000.
Widell, Bjorn: *See*—
Collin, Per Harald; Flink, Sune Natanael; Widell, Bjorn; Hirsch, Martin; and Reh, Lothar, 4,073,642, Cl. 75-35.000.
Widstrand, John C.; and Jurek, Dennis J., to Leeson Electric Corporation. Air cooling means for dynamoelectric machine. 4,074,156, Cl. 310-62.000.
Wiechert, Rudolf: *See*—
Hofmeister, Helmut; Laurent, Henry; Wiechert, Rudolf; Annen, Klaus; and Steinbeck, Hermann, 4,073,900, Cl. 424-243.000.
Wieland, George E., Jr.; and Rudzki, Eugene M., to Bethlehem Steel Corporation. Method of producing silicon steel strip. 4,073,668, Cl. 148-113.000.
Wiest, Hubert; Berger, Rainer; and Lieb, Erwin, to Wacker-Chemie GmbH. Hydrolysis-resistant, film-forming copolymer dispersions. 4,073,779, Cl. 260-79.3MU.
Wiles, James P.: *See*—
Roch, Gerald V.; and Wiles, James P., 4,074,350, Cl. 364-107.000.
Wilke, Robert N.: *See*—
Stach, Leonard J.; and Wilke, Robert N., 4,073,894, Cl. 424-200.000.
Wilke, Wilbur D.: *See*—
Brown, Amos J.; Belshaw, Thomas E.; Knull, Kenneth L.; and Wilke, Wilbur D., 4,073,305, Cl. 137-140.000.
Wilkerson, Alan W. Watt meter providing electrical signal proportional to power. 4,074,194, Cl. 324-142.000.
Will, Fritz G., to General Electric Company. Dendrite-inhibiting electrolytic solution and rechargeable aqueous zinc-halogen cell containing the solution. 4,074,028, Cl. 429-105.000.
Willhoft, Edward Max Adolf. Process for producing a product containing aluminum and chlorine. 4,073,872, Cl. 423-496.000.
Williams, Arthur C. Method and apparatus for rigidly interconnected ceiling and wall construction. 4,073,108, Cl. 52-238.000.
Williams, Carter P.: *See*—
Erickson, John W.; and Williams, Carter P., 4,073,596, Cl. 415-180.000.
Williams, Charles E., to Hough Manufacturing Corporation. Lost motion suspension system for operable partitions. 4,073,092, Cl. 49-127.000.
Williams, Gerald S.: *See*—
Popper, Karel; Camirand, Wayne M.; Williams, Gerald S.; and Mecchi, Edward P., 4,073,747, Cl. 252-412.000.
Williamson, Warren L.: *See*—
Eggleton, Reginald C.; and Williamson, Warren L., 4,074,223, Cl. 340-1.00R.
Willson, Robert D.; and Henderson, Terry L., to United States of America, Health, Education and Welfare. Noise chrono-dosimeter system. 4,073,194, Cl. 73-646.000.
Willums, Jan-Olaf; and Hody, Dieter. Method of underwater hydraulic conveying for ocean mining and the like. 4,073,080, Cl. 37-195.000.
Wilmonti, Richard D., to Hughes Aircraft Company. Adaptive threshold clutter processor. 4,074,264, Cl. 343-17.10R.
Wilson, Harold R.: *See*—
Kamerling, Marc A.; Franks, Jeffrey L.; and Wilson, Harold R., 4,073,855, Cl. 264-249.000.

Wilson, Harry Howard, Jr., to H. Wilson Corporation. Rigid mobile cabinet for audio-visual aids. 4,073,556, Cl. 312-250.000.

Winter, Gerhard: *See*—
Hemmerich, Heinz-Peter; Winter, Gerhard; Rosenkranz, Hans Jurgen; and Woditsch, Peter, 4,073,764, Cl. 260-37.00N.

Wiskott, Erik: *See*—
Troxler, Franz; and Wiskott, Erik, 4,073,909, Cl. 424-258.000.

Wissinger, Lawrence H. Combination reflector and light shield. 4,074,123, Cl. 362-319.000.

Witt, Paul R., Jr., to Grain Processing Corporation. Preparation of a beer-type beverage. 4,073,947, Cl. 426-13.000.

Wittchow, Eberhard: *See*—
Stadie, Lothar; and Wittchow, Eberhard, 4,074,360, Cl. 364-551.000.

Woditsch, Peter: *See*—
Hemmerich, Heinz-Peter; Winter, Gerhard; Rosenkranz, Hans Jurgen; and Woditsch, Peter, 4,073,764, Cl. 260-37.00N.

Woessner, Warren Dexter; Sih, Charles John; Kluender, Harold Clinton; Arndt, Henry Clifford; and Biddlecom, William Gerard, to Miles Laboratories, Inc. Bicycloalkyl derivatives of prostaglandins. 4,074,063, Cl. 560-121.000.

Wolinski, Leon E.; Riebling, Richard G.; and Edholm, John H., to Pratt & Lambert. Chemical milling of neoprene rubber. 4,074,033, Cl. 526-47.000.

Wollen, Carl H., to Leon Chemical & Plastics, Division of U.S. Industries, Inc. Article including acrylic adhesive bonding vinyl coatings to polymeric substrates. 4,074,014, Cl. 428-506.000.

Womack, William B. M.; Starnes, Ralph Emory, Jr.; Headrick, John Charles; and Martin, Ronald Ray, to Southwire Company. Immersion-treating tubular elements. 4,073,978, Cl. 427-235.000.

Wood, Hamish Christopher Swan; and Stirling, Irene, to Burroughs Wellcome Co. 2-Amino-4-hydroxy-6-hydroxymethyl-7,7-diethyl-7,8-dihydropteridine and the 7-spirocyclohexyl analogue thereof. 4,073,786, Cl. 260-251.500.

Wood, Loren E., to Black, Sivalls & Bryson, Inc. Preassembled pressure relief apparatus. 4,073,402, Cl. 220-207.000.

Wooding, Harold C., Jr.: *See*—
Messman, Leonard A.; Wooding, Harold C., Jr.; and Waehner, Glenn C., 4,074,130, Cl. 250-223.00R.

Woods, William E.; Stanley, Philip E.; Izbicki, Kenneth J.; and Ramsdell, Steven C., to Honeywell Information Systems Inc. Trap mechanism for a data processing system. 4,074,353, Cl. 364-200.000.

Woodworth, Frederick Arthur; and Zobel, Ernst-Guenther, to U.S. Philips Corporation. Electronic flash device. 4,074,171, Cl. 315-241.00P.

Wrenn, Francis P. Roll forming, measuring and cutting apparatus. 4,073,447, Cl. 242-56.00R.

Wretlind, Karl Arvid Johannes; Ljungberg, Stellan; Hakansson, Ivan; and Ajaxon, Bengt Magnus, to Apoteksvarucentralen Vitrum AB. Method of enhancing the administration of pharmalogically active agents. 4,073,943, Cl. 424-358.000.

Wright, Allen C., to Utility Products, Inc. Level support guard. 4,073,367, Cl. 182-204.000.

Wright, Donald E. Level. 4,073,062, Cl. 33-388.000.

Wright, Gary Thorup: *See*—
Norton, David Gibbons; and Wright, Gary Thorup, 4,074,330, Cl. 360-102.000.

Wright, Jeremy: *See*—
Callery, Patrick S.; Wright, Jeremy; and Zenker, Nicolas, 4,073,929, Cl. 424-273.00R.

Wu, Che-Kuang, to Corning Glass Works. Optical articles prepared from hydrated glasses. 4,073,654, Cl. 106-52.000.

Wuensch, Steffen: *See*—
Schramm, Heribert; and Wuensch, Steffen, 4,073,348, Cl. 173-48.000.

Wunsch, Gerd: *See*—
Koester, Eberhard; Wunsch, Gerd; Schoenafinger, Eduard; and Schneehage, Hans Henning, 4,073,977, Cl. 427-216.000.

Wurst, Bert; and Vogt, Harald, to Robert Bosch GmbH. Electronic transmission gear change control system. 4,073,203, Cl. 74-866.000.

Wyburn-Mason, Roger, to Simoons, John R. A. Treatment of rheumatoid arthritis and related diseases. 4,073,922, Cl. 424-273.00R.

Wynn-Smith, David, to Chroma-Flex, Inc. Video effects apparatus and method. 4,074,309, Cl. 358-82.000.

Xerox Corporation: *See*—
Haas, Werner E. L.; and Faucz, Eugene C., 4,074,276, Cl. 346-74.100.
Hankee, Roy H.; and Akman, Alp T., 4,074,000, Cl. 428-323.000.
Infante, Carlo, 4,074,147, Cl. 307-230.000.
Mammino, Joseph; and Jossel, Franklin, 4,073,965, Cl. 427-22.000.
Rokos, George Hedley Storm, 4,074,143, Cl. 250-552.000.
Scouten, Charles G.; and Hamilton, Willard C., 4,073,649, Cl. 96-1.400.
Teumer, Roger G.; Warter, Peter J., Jr.; Squassoni, Gino F.; Tulagin, Vseevolod; and Egnaczak, Raymond K., 4,073,583, Cl. 355-3.00P.

Yabuta, Keiichiro; and Koike, Yoshitaka, to Nissan Motor Company, Limited. Fluid pressure control device and motor vehicle braking system incorporating such device. 4,073,542, Cl. 303-6.00C.

Yahraus, William A., to Gould Inc. Sleeve bearing. 4,073,550, Cl. 308-23.000.

Yajima, Shunichi; Kakumoto, Shigeru; Fujimoto, Yoshiji; and Hananoi, Toshihiro, to Hitachi, Ltd. Pattern processing system. 4,074,231, Cl. 340-146.3AG.

Yamada, Koji: *See*—
Teramae, Akira; Yamada, Koji; and Kawasaki, Hironobu, 4,074,011, Cl. 428-422.000.

Yamada, Shoji; Tanaka, Akira; Horii, Shoichi; and Yamashita, Kiyoshi, to Mitsubishi Paper Mills, Ltd. Image-forming layer containing silver halide emulsion and magenta coupler. 4,073,651, Cl. 96-100.00R.

Yamagishi, Akira, to Fuji Photo Optical Co., Ltd. Zoom lens system. 4,073,573, Cl. 350-187.000.

Yamaguchi, Kazuo: *See*—
Mochida, Yukou; Ogawa, Tadao; and Yamaguchi, Kazuo, 4,074,127, Cl. 250-199.000.

Yamaguchi, Masahiko: *See*—
Ozutsumi, Minoru; Miyazawa, Yoshihide; and Yamaguchi, Masahiko, 4,073,614, Cl. 8-25.000.
Ozutsumi, Minoru; Miyazawa, Yoshihide; and Yamaguchi, Masahiko, 4,074,050, Cl. 544-92.000.

Yamaguchi, Tetsuo: *See*—
Takase, Tuneo; and Yamaguchi, Tetsuo, 4,073,131, Cl. 58-23.00R.

Yamakawa, Yukio: *See*—
Nishida, Takeshi; Morioka, Masao; Ohta, Tetsuro; and Yamakawa, Yukio, 4,073,988, Cl. 428-91.000.

Yamaki, Naoomi; Futsuhara, Natsuko; Masuda, Kazue; and Tsuchimoto, Koji, to Agency of Industrial Science and Technology of Japan. Process for converting nitrogen dioxide into nitrogen monoxide. 4,073,866, Cl. 423-405.000.

Yamamoto, Hisao: *See*—
Shimomura, Hiromi; Sugie, Akihiko; Katsube, Junki; and Yamamoto, Hisao, 4,073,933, Cl. 424-299.000.

Yamaoka, Tetsuo: *See*—
Iwata, Hiroshi; and Yamaoka, Tetsuo, 4,074,287, Cl. 354-31.000.

Yamashita, Kiyoshi: *See*—
Yamada, Shoji; Tanaka, Akira; Horii, Shoichi; and Yamashita, Kiyoshi, 4,073,651, Cl. 96-100.00R.

Yamashita, Yoshio: *See*—
Nakayama, Yasuharu; Watanabe, Tadashi; Yamashita, Yoshio; Aihara, Tetsuo; and Toyomoto, Isao, 4,073,758, Cl. 260-23.0EP.

Yamauchi, Kazuhisa; Takakura, Koichi; Kawai, Syuji; and Ohmori, Akio, to Kuraray Co., Ltd. PVA membrane and method for preparing the same. 4,073,733, Cl. 210-500.00M.

Yamazaki, Masafumi; and Nakagawa, Yasuhiko, to Nissan Motor Company, Limited. Torch ignition type internal combustion engine. 4,073,271, Cl. 123-75.00B.

Yamazaki, Yorio, to Kawasaki Jukogyo Kabushiki Kaisha. Stand device for a two-wheeled motorcycle. 4,073,505, Cl. 280-301.000.

Yampolsky, Jack S.: *See*—
Hunt, Paul S.; Elliott, James P.; Gulich, Johann F.; Weber, Max H.; Yampolsky, Jack S.; and Lockett, George E., 4,073,267, Cl. 122-32.000.

Yanagawa, Nobuyuki, to Ricoh Company, Ltd. Cleaning unit for an optical system in a copying machine. 4,074,217, Cl. 355-30.000.

Yano, Katsuhiro: *See*—
Kiritani, Yoshio; Tsuyuguchi, Michio; Ibaragi, Tetsuo; Yano, Katsuhiro; Sunami, Yoshihiko; Nishioka, Kunihiko; and Sumikin Coke Company Limited, 4,073,625, Cl. 44-10.00R.

Yarway Corporation: *See*—
Neyer, Robert D., 4,073,306, Cl. 137-183.000.

Yasuda, Koichi; Ikeda, Yusuke; and Nishida, Yukiaki, to Eisai Co., Ltd. Method for treatment of impaired hearing. 4,073,883, Cl. 424-94.000.

Yasui, Junichi: *See*—
Kakito, Akira; Yasui, Junichi; and Koganei, Yoji, 4,073,028, Cl. 15-102.000.

Yasujima, Nobuo; Arai, Juichiro; Itokawa, Natsuo; and Okino, Katsumoto. Process of manufacturing terminals of a heat-proof metallic thin film resistor. 4,073,971, Cl. 427-103.000.

Yasuma, Toru: *See*—
Murota, Kozo; Matsumoto, Rempei; Yasuma, Toru; Morinaga, Mamoru; Tajima, Shigeo; Nakamura, Masayuki; and Sakaguchi, Akira, 4,073,361, Cl. 181-228.000.

Yasunori, Takaharu: *See*—
Mizutani, Taketomo; Yasunori, Takaharu; and Yoshimi, Kazuyoshi, 4,073,598, Cl. 416-5.000.

Yates, David J. C.; and Murrell, Lawrence L., to Exxon Research & Engineering Co. Method for preparing a highly dispersed supported nickel catalyst. 4,073,750, Cl. 252-459.000.

Yates, Richard Alan, to Du Pont de Nemours, E. I., and Company. Foam texturization of fungal mycelial fibers. 4,073,956, Cl. 426-470.000.

Yellow Springs Instrument Company, Inc., The: *See*—
Newman, David P., 4,073,713, Cl. 204-195.00B.

Yevick, George J., to Personal Communications, Inc. Method of recording on a microfiche. 4,073,650, Cl. 96-46.000.

Yissum Research Development Co. of the Hebrew Univ.: *See*—
Feilchenfeld, Max Hans, 4,073,875, Cl. 423-504.000.

Yokogawa Electric Works, Ltd.: *See*—
Fujita, Hisaya; Kaieda, Nobuo; Sato, Setsuo; and Kawakami, Kenji, 4,074,274, Cl. 346-34.000.
Nakagawa, Mutsuaki; Wakasa, Yutaka; Uchiike, Hisayuki; and Nagata, Susumu, 4,074,354, Cl. 364-200.000.
Saigusa, Tokuji, 4,073,191, Cl. 73-706.000.

Yokoi, Hiroshi; and Shiokawa, Takayasu, to Kokusai Denshin Denwa Kabushiki Kaisha. System for receiving radio waves through single antenna apparatus. 4,074,266, Cl. 343-100.0SA.

Yokoyama, Toshihiko: *See*—
Murakami, Fumiki; Teshima, Soichi; and Yokoyama, Toshihiko, 4,074,062, Cl. 560-217.000.

Yoshida Kogyo K.K.: *See—*
Ookawa, Taro; and Takeda, Shuichi, 4,073,093, Cl. 49-381.000.

Yoshida, Noboru. Unit and combined housing structures. 4,073,101, Cl. 52-79.100.

Yoshimi, Kazuyoshi: *See—*
Mizutani, Taketomo; Yasunori, Takaharu; and Yoshimi, Kazuyoshi, 4,073,598, Cl. 416-5.000.

Yoshizaki, Akira: *See—*
Ueda, Hiroshi; and Yoshizaki, Akira, 4,074,291, Cl. 354-51.000.

Yotsuyanagi, Yoshihiko; Araki, Naganori; Nagasawa, Shigeru; and Okitsu, Toshinao, to Konishi Co., Ltd. Solid adhesive compositions. 4,073,756, Cl. 260-18.00N.

Young, Bruce O.: *See—*
Seegmiller, Wan; and Young, Bruce O., 4,073,482, Cl. 267-139.000.

Young, Donald C., to Union Oil Company of California. Topical nitrogen fertilization method. 4,073,633, Cl. 71-28.000.

Yui, Takayuki: *See—*
Otomo, Koju; Itoh, Takeshi; Hayashi, Kazuyuki; Omoto, Hiroshi; Yui, Takayuki; and Suzuki, Makoto, 4,074,232, Cl. 340-147.00R.

Zahnradfabrik Friedrichshafen AG: *See—*
Lang, Armin; and Fassbender, Rolf, 4,073,140, Cl. 60-405.000.

(Zaidanhojin) Sagami Chemical Research Center: *See—*
Kondo, Kiyoshi; Tunemoto, Daiei; and Hiro, Etsuko, 4,073,799, Cl. 260-345.80P.

Zangenfeind, Helmut; Burchardi, Jurgen; and Lederer, Josef, to AAG-FA-Gevaert, A.G. Apparatus for applying indicia to films and envelopes in photographic processing laboratories. 4,073,588, Cl. 355-41.000.

Zannucci, Joseph S.: *See—*
Wang, Richard H. S.; and Zannucci, Joseph S., 4,073,745, Cl. 252-403.000.

Zaretti, Luigi. Precast element for the construction of trenched structures and the process related thereto. 4,073,148, Cl. 61-42.000.

Zarogatsky, Leonid Petrovich: *See—*
Rundkvist, Konstantin Alexandrovich; Ivanov, Nikolai Alexeevich; Ivanov, Boris Gavrilovich; Zarogatsky, Leonid Petrovich; Mitrofanov, Evgeny Sergeevich; and Blekhman, Ilya Izrailevich, 4,073,446, Cl. 241-207.000.

Zenker, Nicolas: *See—*
Callery, Patrick S.; Wright, Jeremy; and Zenker, Nicolas, 4,073,929, Cl. 424-273.00R.

Zetco Manufacturing Company, Incorporated: *See—*
Carter, Norman R., 4,073,388, Cl. 214-8.50A.

Zilver, Edwin. Device for making a curtain hang in regular pleats. 4,073,331, Cl. 160-348.000.

Zimmermann, Detlef: *See—*
Debortoli, George; and Zimmermann, Detlef, 4,074,337, Cl. 361-124.000.

Zinnes, Harold; Lindo, Neil A.; and Shavel, John, Jr., to Warner-Lambert Company. Process for the preparation of 4-hydroxy-2H-1,2-benzothiazine-3-carboxamide 1,1-dioxides. 4,074,048, Cl. 544-49.000.

Zobel, Ernst-Guenther: *See—*
Woodworth, Frederick Arthur; and Zobel, Ernst-Guenther, 4,074,171, Cl. 315-241.00P.

Zrudsky, Donald R., to University of Toledo, The. Chopper-multiplexer system for measurement of remote low-level signals. 4,074,076, Cl. 179-15.0BL.

Zschocke, Rainer Hans: *See—*
Grill, Helmut; Zschocke, Rainer Hans; Wagner, Josef; Hofrichter, Gernot; and Janiak, P. Stefan, 4,073,935, Cl. 424-308.000.

Zumin Tricerri, Silvia; and Chiarani, Lino, to Pierrel S.p.A. 3-[5'(1-Methyltetrazolylthiomethyl)]-7-[2(3''-nitroimidazolyl)acetyl amino]-cephalosporanic acid, salts, and its pharmaceutical composition. 4,073,903, Cl. 424-246.000.

Zwirlein, John F., to Olin Corporation. Automatically controlled cleaning fluid circuit for a foam generating apparatus and method. 4,073,664, Cl. 134-18.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 14TH DAY OF FEBRUARY, 1978

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Abraham, James G.: *See—*
Willke, Herbert L.; and Abraham, James G., Re. 29,539, Cl. 254-89.00R.

Adams, William E.; and Lucht, Wilbert A., to United States Steel Corporation. Torque balanced rope. Re. 29,537, Cl. 57-148.000.

Armco Steel Corporation: *See—*
Willke, Herbert L.; and Abraham, James G., Re. 29,539, Cl. 254-89.00R.

Budzich, Tadeusz. Load responsive fluid control valve. Re. 29,538, Cl. 137-596.200.

Ciba-Geigy AG: *See—*
Randell, Donald Richard; and Pickles, Wilfred, Re. 29,540, Cl. 260-966.000.

Fearing, Donald David. Marking tag. Re. 29,536, Cl. 40-301.000.

Lucht, Wilbert A.: *See—*
Adams, William E.; and Lucht, Wilbert A., Re. 29,537, Cl. 57-148.000.

Pickles, Wilfred: *See—*
Randell, Donald Richard; and Pickles, Wilfred, Re. 29,540, Cl. 260-966.000.

Randell, Donald Richard; and Pickles, Wilfred, to Ciba-Geigy AG. Phosphorylated alkylphenol/phenol ester mixtures. Re. 29,540, Cl. 260-966.000.

United States Steel Corporation: *See—*
Adams, William E.; and Lucht, Wilbert A., Re. 29,537, Cl. 57-148.000.

Willke, Herbert L.; and Abraham, James G., to Armco Steel Corporation. Leg supported offshore structure with jacking apparatus. Re. 29,539, Cl. 254-89.00R.

LIST OF PLANT PATENTEES

Andrea, Frank. Geranium plant. 4,215, 2-14-78, Cl. 68.000.

Holtkamp, Reinhold. African violet plant. 4,213, 2-14-78, Cl. 69.000.

Holtkamp, Reinhold. African violet plant. 4,214, 2-14-78, Cl. 69.000.

LIST OF DESIGN PATENTEES

Acoustic Fiber Sound Systems, Inc.: *See—*
Croup, Robert E., 247,236, Cl. D14-33.000.
Croup, Robert E., 247,237, Cl. D14-35.000.

American Optical Corporation: *See—*
Armbruster, John T., 247,245, Cl. D16-83.000.
Napoli, Joseph D., 247,251, Cl. D24-17.000.

Armbruster, John T., to American Optical Corporation. Dual viewer attachment for a microscope. 247,245, 2-14-78, Cl. D16-83.000.

Aurora S.p.A.: *See—*
Verona, Franco, 247,246, Cl. D19-45.000.

Baechtle, Charles Paul; and Stram, John Van Dyke, to International Business Machines Corporation. Keyboard. 247,239, 2-14-78, Cl. D14-40.000.

Ball Corporation: *See—*
Campbell, William B., 247,229, Cl. D11-135.000.
Campbell, William B., 247,230, Cl. D11-137.000.

Barber, Robert N. Portable reel for electric extension cable. 247,218, 2-14-78, Cl. D8-359.000.

Baxter Travenol Laboratories, Inc.: *See—*
Bruni, James G.; Hauser, Stephen G.; Lessner, David Lynnwood; and Macemon, James Herbert, 247,226, Cl. D10-46.000.
Bruni, James G.; Hauser, Stephen G.; Lessner, David Lynnwood; and Macemon, James Herbert, 247,227, Cl. D10-46.000.

Beckwith, Edward K. Tooth-shaped sand timer. 247,225, 2-14-78, Cl. D10-44.000.

Bourke, Robert E., to GAF Corporation. Transparency projector. 247,242, 2-14-78, Cl. D16-21.000.

Brown, Brian E.; and Hall, Alfred G., to Moduloc Concrete Products (London) Ltd. Pre-cast concrete unit for manholes. 247,254, 2-14-78, Cl. D25-36.000.

Bruni, James G.; Hauser, Stephen G.; Lessner, David Lynnwood; and Macemon, James Herbert, to Baxter Travenol Laboratories, Inc. Spectrophotofluorometer. 247,226, 2-14-78, Cl. D10-46.000.

Bruni, James G.; Hauser, Stephen G.; Lessner, David Lynnwood; and Macemon, James Herbert, to Baxter Travenol Laboratories, Inc. Component for a spectrophotofluorometer. 247,227, 2-14-78, Cl. D10-46.000.

Burlington Industries, Inc.: *See—*
Carroll, Barry G., 247,223, Cl. D9-193.000.

Calkins, James Stewart: *See—*
Nilsen, Alfred; and Calkins, James Stewart, 247,213, Cl. D8-18.000.

Campbell, William B., to Ball Corporation. Plaque. 247,229, 2-14-78, Cl. D11-135.000.

Campbell, William B., to Ball Corporation. Plaque. 247,230, 2-14-78, Cl. D11-137.000.

Carroll, Barry G., to Burlington Industries, Inc. Pantyhose package. 247,223, 2-14-78, Cl. D9-193.000.

Combi Co., Ltd.: *See—*
Nakao, Shinroku, 247,258, Cl. D34-15.00B.

Cote, Paul L., to Gentex Corporation. Hand-held microphone. 247,235, 2-14-78, Cl. D14-12.000.

Croup, Robert E., to Acoustic Fiber Sound Systems, Inc. Loudspeaker. 247,236, 2-14-78, Cl. D14-33.000.

Croup, Robert E., to Acoustic Fiber Sound Systems, Inc. Loudspeaker. 247,237, 2-14-78, Cl. D14-35.000.

Daiwa Seiko, Inc.: *See—*
Okada, Kiyoshi, 247,247, Cl. D22-25.000.

Daugherty, Gaye Lorraine. Planter. 247,204, 2-14-78, Cl. D6-137.000.

Degremont S.A.: *See—*
Durot, Jean, 247,248, Cl. D23-1.000.

Dow Chemical Company, The: *See—*
Nilsen, Alfred; and Calkins, James Stewart, 247,213, Cl. D8-18.000.

Durot, Jean, to Degremont S.A. Diffusion plate for oxygenation treatment of sludge or the like. 247,248, 2-14-78, Cl. D23-1.000.

Dwillies, Paul K. L.: *See—*
Eppich, Helmut; and Dwillies, Paul K. L., 247,238, Cl. D14-40.000.

Eastman Kodak Company: *See—*
Hansen, David E., 247,241, Cl. D16-04.000.

Ebco Industries, Ltd.: *See—*
Eppich, Helmut; and Dwillies, Paul K. L., 247,238, Cl. D14-40.000.

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Cote, Paul L., 247,235, Cl. D14-12.000.

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Schimanski, Georg, 247,249, Cl. D23-150.000.

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Ueda, Masami; Mishiro, Benito; Igo, Toshio; and Hamada, Masanori, 247,240, Cl. D14-72.000.

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Hauser, Stephen G.: *See—*
Bruni, James G.; Hauser, Stephen G.; Lessner, David Lynnwood; and Macemon, James Herbert, 247,226, Cl. D10-46.000.
Bruni, James G.; Hauser, Stephen G.; Lessner, David Lynnwood; and Macemon, James Herbert, 247,227, Cl. D10-46.000.
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Hermann, Lynda S.: *See—*
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Hormann, Franz. Hand stamp. 247,261, 2-14-78, Cl. D64-10.000.
Igo, Toshio: *See—*
Ueda, Masami; Mishiro, Benito; Igo, Toshio; and Hamada, Masanori, 247,240, Cl. D14-72.000.
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Baechtle, Charles Paul; and Stram, John Van Dyke, 247,239, Cl. D14-40.000.
Interstate Travel Services, Inc.: *See—*
Smith, John N., 247,264, Cl. D96-9.000.
Iwata, Norio; and Kojima, Hiroshi. Vehicle tire. 247,233, 2-14-78, Cl. D12-143.000.
Jacobs, Gary Becker. Foot ski. 247,260, 2-14-78, Cl. D34-40.000.
Jang, Alan J.: *See—*
Solidum, Gorgonio M.; Jang, Alan J.; and Yee, Thomas, 247,231, Cl. D11-160.000.
Kabushiki Kaisha Yoneya Gangu: *See—*
Yonezawa, Hiroichi, 247,259, Cl. D34-15.00B.
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Welch, Robert J., 247,212, Cl. D7-179.000.
Mishiro, Benito: *See—*
Ueda, Masami; Mishiro, Benito; Igo, Toshio; and Hamada, Masanori, 247,240, Cl. D14-72.000.
Moduloc Concrete Products (London) Ltd.: *See—*
Brown, Brian E.; and Hall, Alfred G., 247,254, Cl. D25-36.000.
Montgomery, William P.: *See—*
Paone, Anthony N.; and Montgomery, William P., 247,222, Cl. D9-192.000.
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Rosenberg, David J., 247,252, Cl. D24-52.000.
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Tweedie, Thomas D., 247,262, Cl. D87-3.00F.
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Merry, Carl Alan, 247,217, Cl. D8-356.000.
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Pemberton, John Hunter, 247,224, Cl. D10-38.000.
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Nelson, John A.; and Patla, Jacob W., 247,243, Cl. D16-32.000.
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Solidum, Gorgonio M.; Jang, Alan J.; and Yee, Thomas, 247,231, Cl. D11-160.000.
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CLASS 3

13 4,073,014
4,073,015

CLASS 4

191 4,073,018

CLASS 5

81 R 4,073,016
97 4,073,017
355 4,073,020
365 4,073,019
4,073,021

CLASS 8

25 4,073,614
4,073,615
34 4,073,616
116 P 4,073,617

CLASS 12

135 A 4,073,022
142 J 4,073,024
142 RS 4,073,023

CLASS 14

2.4 4,073,025

CLASS 15

102 4,073,028
104.1 R 4,073,026
172 4,073,027
302 4,073,029
322 4,073,030
373 4,073,031

CLASS 16

52 4,073,033
87 B 4,073,034
96 R 4,073,035
110 R 4,073,036
169 4,073,037
189 4,073,038

CLASS 17

1 F 4,073,039
43 4,073,040
71 4,073,041

CLASS 21

2.7 R 4,073,618

CLASS 23

232 R 4,073,619
253 R 4,073,620
254 E 4,073,621
258.5 BH 4,073,622
259 4,073,623

CLASS 24

241 P 4,073,042

CLASS 26

33 4,073,043

CLASS 29

24.5 4,073,044
157.3 C 4,073,045
401 R 4,073,046
427 4,073,051
450 4,073,047
4,073,048
4,073,050
458 4,073,049
570 4,073,052
4,073,053
580 4,073,054
583 4,073,055

CLASS 30

123.5 4,073,056
153 4,073,057
257 4,073,058
261 4,073,059
279 R 4,073,060

CLASS 32

14 B 4,073,061

CLASS 33

388 4,073,062

CLASS 34

32 4,073,063
57 A 4,073,064
71 4,073,065
73 4,073,066

CLASS 35

8 R 4,073,067
9 B 4,073,068
13 4,073,069
26 4,073,070
35 R 4,073,071

CLASS 36

44 4,073,072
50 4,073,073
104 4,073,074
127 4,073,075

CLASS 37

42 VL 4,073,076
50 4,073,077
77 4,073,078
78 4,073,079
195 4,073,080

CLASS 40

301 Re.29,536
470 4,073,081
591 4,073,082

CLASS 43

4 4,073,083
42.35 4,073,084
54.5 R 4,073,085

CLASS 44

1 R 4,073,624
10 R 4,073,625
57 4,073,626

CLASS 46

91 4,073,086
202 4,073,087
265 4,073,088

CLASS 47

17 4,073,089
43 4,073,090
45 4,073,091

CLASS 48

62 R 4,073,627
4,073,628
77 4,073,629
197 R 4,073,630

CLASS 49

127 4,073,092
381 4,073,093

CLASS 51

111 R 4,073,094
164 4,073,095
309 A 4,073,096

CLASS 52

22 4,073,097
66 4,073,098
69 4,073,099
79.1 4,073,101
79.13 4,073,102
79.3 4,073,100
93 4,073,103
125 4,073,104
169.9 4,073,105
199 4,073,106
235 4,073,107
238 4,073,108
281 4,073,109
303 4,073,110
407 4,073,111
677 4,073,112
710 4,073,113
4,073,114
745 4,073,115

CLASS 53

14 4,073,117
23 4,073,118
76 4,073,119
79 4,073,120
112 A 4,073,121
131 4,073,122
182 R 4,073,116
234 4,073,123

CLASS 55

97 4,073,631
374 4,073,632

CLASS 56

1 4,073,124

CLASS 57

38.3 4,073,125
58.36 4,073,127
58.89 4,073,128
4,073,129
58.95 4,073,126
148 Re.29,537

CLASS 58

9 4,073,130
13 4,073,133
23 BA 4,073,132
23 R 4,073,131

CLASS 60

39.28 R 4,073,135
4,073,136
39.29 4,073,134
39.32 4,073,137
245 4,073,138
357 4,073,139
405 4,073,140
421 4,073,141
502 4,073,142

CLASS 61

1 F 4,073,143
1 R 4,073,144
4 4,073,145
19 4,073,146
26 4,073,147
42 4,073,148
45 D 4,073,149
4,073,150
4,073,151
63 4,073,152
85 4,073,153
86 4,073,154
88 4,073,155
107 4,073,156
111 4,073,157

CLASS 62

266 4,073,158
340 4,073,159

CLASS 64

9 R 4,073,160
13 4,073,161
17 R 4,073,162

CLASS 66

14 4,073,163
65 4,073,164

CLASS 70

133 4,073,167
165 4,073,168
166 4,073,169
256 4,073,170
366 4,073,171
371 4,073,165
394 4,073,166
417 4,073,172

CLASS 71

28 4,073,633
34 4,073,635
37 4,073,634
92 4,073,636
94 4,073,637
100 4,073,638

CLASS 72

250 4,073,173
254 4,073,174
325 4,073,175
328 4,073,176
339 4,073,177
352 4,073,178
409 4,073,179
453.01 4,073,180
479 4,073,181

CLASS 73

1 R 4,073,182
23 4,073,183
37.6 4,073,184
103 4,073,185
114 4,073,186
139 4,073,187
147 4,073,188
228 4,073,189
339 C 4,073,190
429 4,073,192
432 PS 4,073,193
646 4,073,194
706 4,073,191

CLASS 74

25 4,073,195
52 4,073,196
110 4,073,197
360 4,073,198
473 R 4,073,199
501 R 4,073,200
665 L 4,073,201
860 4,073,202
866 4,073,203
4,073,204

CLASS 75

.5 R 4,073,639
10 R 4,073,640
11 4,073,641
35 4,073,642
49 4,073,643
68 R 4,073,644
74 4,073,645
76 4,073,646
235 4,073,647
245 4,073,648

CLASS 81

3.1 R 4,073,205

CLASS 83

489 4,073,206
659 4,073,207
4,073,208

CLASS 84

1.24 4,073,209
291 4,073,211

CLASS 85

45 4,073,210
79 4,073,212

CLASS 89

1.701 4,073,213

CLASS 90

24 D 4,073,214
58 R 4,073,215

CLASS 91

480 4,073,216

CLASS 92

27 4,073,217
85 R 4,073,218
128 4,073,219
190 4,073,220
221 4,073,221

CLASS 93

36 M 4,073,222
93 HT 4,073,223

CLASS 96

1.4 4,073,649
46 4,073,650
100 R 4,073,651
101 4,073,652

CLASS 98

41 R 4,073,224

CLASS 99

339 4,073,225
427 4,073,226
574 4,073,032

CLASS 100

52 4,073,227
4,073,228
98 R 4,073,229

CLASS 101

32 4,073,230
48 4,073,231
126 4,073,232
132.5 4,073,233
288 4,073,234

CLASS 102

22 4,073,235

CLASS 104

172 C 4,073,237
172 S 4,073,236
4,073,238

CLASS 105

377 4,073,239

CLASS 106

26 4,073,653
52 4,073,654
4,073,655
57 4,073,656
73.5 4,073,657
92 4,073,658
277 4,073,659
311 4,073,660

CLASS 108

20 4,073,240
91 4,073,241

CLASS 110

8 R 4,073,242
99 R 4,073,243
165 R 4,073,244

CLASS 111

1 4,073,245

CLASS 112

121.11 4,073,246
121.12 4,073,247
207 4,073,248
212 4,073,249
256 4,073,251
265 4,073,252
274 4,073,250
275 4,073,253

CLASS 114

90 4,073,254
230 4,073,255
306 4,073,256

CLASS 115

12 R 4,073,257
4,073,258

CLASS 116

33 4,073,259

CLASS 118

8 4,073,260
16 4,073,261
52 4,073,262
249 4,073,263
250 4,073,264
634 4,073,265
647 4,073,266

CLASS 122

32 4,073,267

CLASS 123

8.13 4,073,268
32 EB 4,073,270
32 EE 4,073,269
75 B 4,073,271
103 B 4,073,272
119 E 4,073,273
119 R 4,073,274
139 AF 4,073,275
139 BD 4,073,277
139 E 4,073,276
198 DC 4,073,279
198 F 4,073,278

CLASS 124

72 4,073,280

CLASS 125

11 CD 4,073,281

CLASS 126

270 4,073,282
4,073,283
271 4,073,284
4,073,285
344 4,073,286

CLASS 128

2 F 4,073,288
2 R 4,073,287
24 A 4,073,289
75 4,073,290
155 4,073,291
214 E 4,073,292
214.4 4,073,297
223 4,073,293
278 4,073,294
295 4,073,295
303 R 4,073,296
337 4,073,298
425 4,073,299

CLASS 131

61 A 4,073,300

CLASS 134

1 4,073,661
2 4,073,662
10 4,073,663
18 4,073,664
65 4,073,301
167 C 4,073,302

CLASS 136

202 4,073,665

CLASS 137

15 4,073,303
101.21 4,073,304
140 4,073,305
183 4,073,306
283 4,073,307
340 4,073,308
344 4,073,309
389 4,073,310
513.3 4,073,311
596.2 Re.29,538
625.47 4,073,314
625.6 4,073,313
629 4,073,315
829 4,073,316
877 4,073,312

CLASS 138

147 4,073,317
149 4,073,318

CLASS 139

134 4,073,319
383 R 4,073,320

CLASS 141

27 4,073,321
169 4,073,322
326 4,073,323

CLASS 144

82 4,073,324
193 A 4,073,325
209 R 4,073,326

CLASS 145

30 A 4,073,327

CLASS 148

11.5 Q 4,073,666
12.7 C 4,073,667
113 4,073,668

CLASS 150

1.5 R 4,073,328

CLASS 151

20 4,073,329

CLASS 152

361 DM 4,073,330

CLASS 156

179 4,073,670
219 4,073,671
4,073,672
244 4,073,673
285 4,073,674
600 4,073,675
624 4,073,676
643 4,073,669

CLASS 159

6 W 4,073,677

CLASS 160

348 4,073,331

CLASS 162

19 4,073,678
306 4,073,679

CLASS 164

4 4,073,332
66 4,073,333
87 4,073,334
154 4,073,335
286 4,073,336

CLASS 165

9 4,073,337
86 4,073,338
94 4,073,339
166 4,073,340

CLASS 166

65 R 4,073,341
295 4,073,342
4,073,343
307 4,073,344

CLASS 172

413 4,073,345
439 4,073,346
710 4,073,347

CLASS 173

48 4,073,348
59 4,073,349
139 4,073,350

CLASS 174

28 4,074,064
87 4,074,065

CLASS 175

14 4,073,351
53 4,073,352
56 4,073,353
329 4,073,354

CLASS 176

3 4,073,680
36 R 4,073,681
38 4,073,682
86 L 4,073,683
86 R 4,073,684
87 4,073,685

CLASS 177

83 4,073,355

CLASS 178

22 4,074,066
23 R 4,074,067
4,074,068
69.1 4,074,080

CLASS 179

1 D 4,074,070
1 SC 4,074,069
6 R 4,074,071
6.3 R 4,074,079
15 AQ 4,074,072
15 AT 4,074,077
15 BL 4,074,076
15 BP 4,074,073
15 BT 4,074,075
15 BW 4,074,074
84 C 4,074,078
84 R 4,074,081
100.1 TD 4,074,083
4,074,084
100.11 4,074,082
100.3 B 4,074,085
170.2 4,074,086
4,074,087

CLASS 180

1 G 4,073,356
64 R 4,073,357
75 4,073,358
98 4,073,359
104 4,073,360
139 4,073,364

CLASS 181

117 4,073,362
4,073,363
147 4,073,365
158 4,073,366
228 4,073,361

CLASS 182

204 4,073,367

CLASS 186

1 C 4,073,368

CLASS 188

5 4,073,369

CLASS 192

58 B 4,073,370

CLASS 195

2 4,073,686
36 P 4,073,687
49 4,073,688
63 4,073,689
100 4,073,690
103.5 K 4,073,693
103.5 M 4,073,691
103.5 R 4,073,692
103.7 4,073,694
127 4,073,695
142 4,073,696

CLASS 197

157 4,073,371

CLASS 198

341 4,073,372
421 4,073,373
425 4,073,374
466 4,073,375
498 4,073,376
624 4,073,377
627 4,073,378
796 4,073,379

CLASS 200

5 A 4,074,088
5 E 4,074,089
19 DR 4,074,090
50 A 4,074,091
51.07 4,074,092
52 R 4,074,093
61.13 4,074,094
81.9 M 4,074,095
81.9 R 4,074,097
83 D 4,074,096
144 R 4,074,098
153 S 4,074,099
279 4,074,112
339 4,074,100

CLASS 202

254 4,073,697

CLASS 204

1 T 4,073,698
13 4,073,699
43 G 4,073,700
54 R 4,073,701
59 R 4,073,702
70 4,073,703
4,073,704
92 4,073,705
98 4,073,706
105 R 4,073,707
106 4,073,708
113 4,073,709
129.65 4,073,710
181 F 4,073,711
186 4,073,712
195 B 4,073,713
243 R 4,073,714
256 4,073,715

CLASS 206

219 4,073,380
331 4,073,381

CLASS 208

66 4,073,716
74 4,073,717
80 4,073,718
180 4,073,719
4,073,720
251 H 4,073,721

CLASS 210

5 4,073,722
23 H 4,073,724
23 R 4,073,723
31 C 4,073,725
45 4,073,726
63 R 4,073,727
71 4,073,728
80 4,073,729
321 R 4,073,730
376 4,073,731
491 4,073,732
500 M 4,073,733
532 R 4,073,734

CLASS 211

1 4,073,382
1.5 4,073,383
134 4,073,384

CLASS 213

100 R 4,073,385

CLASS 214

1 F 4,073,386
6 P 4,073,387
8.5 A 4,073,388
10.5 D 4,073,389
14 4,073,390
65 4,073,391
83.1 4,073,392
83.3 4,073,393
145 R 4,073,394
450 4,073,395
515 4,073,396

CLASS 215

1 C 4,073,397
253 4,073,398
254 4,073,399

CLASS 219

10.49 R 4,074,101
10.55 E 4,074,102
98 4,074,103
121 LM 4,074,104
137 R 4,074,106
137.8 4,074,105
212 4,074,107
214 4,074,108
216 4,074,109
240 4,074,110
275 4,074,111

CLASS 220

63 R 4,073,400
88 R 4,073,401
207 4,073,402
269 4,073,403

CLASS 221

63 4,073,404
89 4,073,405
102 4,073,407

CLASS 222

94 4,073,406
145 4,073,408
146 HE 4,073,409
181 4,073,410
192 4,073,411
4,073,412
529 4,073,413
602 4,073,414

CLASS 223

92 4,073,415

CLASS 224

5 H 4,073,416
42.1 G 4,073,417
45 R 4,073,418

CLASS 225

44 4,073,419

CLASS 226

42 4,073,420
97 4,073,421
129 4,073,422

CLASS 227

7 4,073,423

CLASS 228

4.5 4,073,424
116 4,073,425
122 4,073,426
165 4,073,427
178 4,073,428

CLASS 229

62.5 4,073,429

CLASS 232

35 4,073,430

CLASS 233

7 4,073,431

CLASS 235

83 4,074,116
92 FQ 4,073,432
92 T 4,074,117
419 4,074,113
4,074,120
462 4,074,115
463 4,074,114

CLASS 236

49 4,073,433

CLASS 237

2 B 4,073,434

CLASS 238

349 4,073,435

CLASS 239

8 4,073,436
131 4,073,437
227 4,073,438
265.29 4,073,440
265.41 4,073,441
655 4,073,439

CLASS 241

37 4,073,442
65 4,073,443
73 4,073,444
101.7 4,073,445
207 4,073,446

CLASS 242

56 R 4,073,447
57.1 4,073,448
107.1 4,073,449
131 4,073,450
191 4,073,451

CLASS 244

118 R 4,073,452

CLASS 246

125 4,073,453

CLASS 248

188.2 4,073,454
291 4,073,455
337 4,073,456
340 4,073,457
4,073,458
394 4,073,459
441 R 4,073,460
475 R 4,073,461
537 4,073,462

CLASS 249

102 4,073,463

CLASS 250

199 4,074,127
205 4,074,128
212 4,074,129
223 R 4,074,130
237 G 4,074,131
277 R 4,074,132
315 A 4,074,133
324 4,074,134
366 4,074,135
380 4,074,137
392 4,074,136
435 4,074,138
492 A 4,074,139
492 R 4,074,140
517 4,074,141
551 4,074,142
552 4,074,143

CLASS 251

7 4,073,467
26 4,073,464
58 4,073,465
63.4 4,073,466
77 4,073,468
86 4,073,469
163 4,073,470
176 4,073,471
229 4,073,472
298 4,073,473
368 4,073,474

CLASS 252

8.8 4,073,735
31 4,073,736
51.5 A 4,073,737
56 R 4,073,738
62.1 P 4,073,739
156 4,073,740
187 R 4,073,741
299 4,073,742
309 4,073,743
389 R 4,073,744
403 4,073,745
404 4,073,746
412 4,073,747
428 4,073,748
455 R 4,073,749
459 4,073,750
522 4,073,751

CLASS 254

66 4,073,475
89 R Re.29,539
184 4,073,476

CLASS 256

22 4,073,477
27 4,073,478

CLASS 260

2.1 R 4,073,752
2.3 4,073,753
17 R 4,073,754
17.4 BB 4,073,755
18 N 4,073,756
19 R 4,073,757
23 EP 4,073,758
23 H 4,073,782
28.5 AS 4,073,759
4,073,760
29.2 N 4,073,788
29.3 4,073,761
4,073,762
29.4 UA 4,073,763
37 N 4,073,764
40 R 4,073,765
42.14 4,073,766
45.7 S 4,073,768
45.75 B 4,073,772
45.8 NW 4,073,770
45.8 R 4,073,767
4,073,769
45.9 NC 4,073,771
47 CP 4,073,773
47 EP 4,073,775
47 UA 4,073,774
51 EP 4,073,776
75 S 4,073,777
78 L 4,073,778
79.3 MU 4,073,779
112 B 4,073,886
112.5 R 4,073,780
152 4,073,781
239.1 4,073,783
243.3 4,073,784
4,073,785
251.5 4,073,786
290 P 4,073,787
293.58 4,073,789
293.73 4,073,790
294.8 R 4,073,791
296 H 4,073,792
306.8 D 4,073,793
326 C 4,073,794
326.14 T 4,073,795
326.33 4,073,796
327 M 4,073,797
340.5 R 4,073,798
345.8 P 4,073,799
404.5 4,073,800
448.2 E 4,073,801
512 R 4,073,802
515 A 4,073,803
534 R 4,073,804
544 K 4,073,806
562 N 4,073,807
563 R 4,073,808
590 C 4,073,805
606.5 P 4,073,809
4,073,810
611 A 4,073,811
613 R 4,073,812
617 C 4,073,813
619 A 4,073,814
4,073,815
648 R 4,073,816
653.1 T 4,073,817
668 F 4,073,818
674 N 4,073,819
683 D 4,073,820
683.47 4,073,821
4,073,822
683.48 4,073,823
823 4,073,824
824 R 4,073,825
831 4,073,826
835 4,073,827
859 R 4,073,828
860 4,073,829
4,073,830
876 B 4,073,831
966 Re.29,540

CLASS 261

118 4,073,832

CLASS 264

0.5 4,073,834
4 4,073,833
22 4,073,835
36 4,073,836
37 4,073,838
38 4,073,837
45.1 4,073,839
45.3 4,073,840
46.6 4,073,841
53 4,073,842
4,073,843
55 4,073,844
65 4,073,845
4,073,846
89 4,073,847
93 4,073,850
109 4,073,851
120 4,073,848
122 4,073,852
132 4,073,853
161 4,073,854
236 4,073,849
249 4,073,855
259 4,073,856
262 4,073,858
291 4,073,857
322 4,073,859

CLASS 266

173 4,073,479
201 4,073,480
215 4,073,481

CLASS 267

139 4,073,482

CLASS 269

25 4,073,483
321 CF 4,073,484

CLASS 270

21 4,073,485
69 4,073,486

CLASS 271

64 4,073,487
263 4,073,488
277 4,073,489

CLASS 272

136 4,073,490

CLASS 273

29 B 4,073,491
80.2 4,073,492
148 R 4,073,493
150 4,073,494

CLASS 274

1 R 4,073,495
9 B 4,073,496

CLASS 279

2 R 4,073,497
62 4,073,498

CLASS 280

1.1 R 4,073,499
87.04 R 4,073,500
164 R 4,073,501
166 4,073,502
203 4,073,503
220 4,073,504
301 4,073,505
402 4,073,506
477 4,073,507
478 R 4,073,508
618 4,073,509

CLASS 281

15 R 4,073,510

CLASS 285

3 4,073,511
12 4,073,512
93 4,073,513
127 4,073,514
158 4,073,515

CLASS 290

55 4,073,516

CLASS 292

60 4,073,517
144 4,073,518
216 4,073,519
4,073,520
256.65 4,073,521
262 4,073,522
264 4,073,523
341.12 4,073,524
346 4,073,525
347 4,073,526
4,073,527

CLASS 293

98 4,073,528

CLASS 294

19 A 4,073,529
19 R 4,073,530
83 R 4,073,531
107 4,073,532
118 4,073,533

CLASS 296

37.16 4,073,534
137 A 4,073,535
137 G 4,073,536

CLASS 297

384 4,073,537
417 4,073,538
455 4,073,539

CLASS 301

108 A 4,073,540

CLASS 303

3 4,073,541
6 C 4,073,542
10 4,073,543
83 4,073,544
109 4,073,545
115 4,073,546

CLASS 307

10 R 4,074,144
4,074,145
60 4,074,146

230 4,074,147
279 4,074,148
351 4,074,149
362 4,074,150
4,074,151

CLASS 308

6 C 4,073,547
8.2 4,073,548
9 4,073,549
23 4,073,550
195 4,073,551
201 4,073,552

CLASS 310

12 4,074,153
29 4,074,154
59 4,074,155
62 4,074,156
67 R 4,074,157
90 4,074,158
154 4,074,159
184 4,074,160
194 4,074,161
245 4,074,162
334 4,074,152

CLASS 312

184 4,073,553
199 4,073,554
229 4,073,555
250 4,073,556
284 4,073,557

CLASS 313

13 4,074,163
25 4,074,164
112 4,074,165
185 4,074,166
222 4,074,167
4,074,168

CLASS 315

39.75 4,074,169
120 4,074,170
241 P 4,074,171
307 4,074,172

CLASS 316

18 4,073,558

CLASS 318

138 4,074,173
197 4,074,174
332 4,074,175
371 4,074,176
602 4,074,177
631 4,074,178
696 4,074,179

CLASS 322

29 4,074,180

CLASS 323

8 4,074,181
25 4,074,182

CLASS 324

16 R 4,074,183
30 R 4,074,184
51 4,074,187
52 4,074,188
73 R 4,074,189
77 A 4,074,190
79 R 4,074,191
103 R 4,074,192
126 4,074,193
142 4,074,194
158 D 4,074,195
166 4,074,196
205 4,074,197
208 4,074,185
222 4,074,186

CLASS 325

3 4,074,198
50 4,074,199
335 4,074,200
363 4,074,201

CLASS 328

258 4,074,202

CLASS 330

4.3 4,074,203
109 4,074,204
257 4,074,205
269 4,074,206

CLASS 331

1 A 4,074,207
94.5 P 4,074,208

CLASS 332

19 4,074,209

CLASS 333

29 4,074,210
31 R 4,074,211
70 T 4,074,212
71 4,074,213
73 S 4,074,214
80 R 4,074,215

CLASS 334

15 4,074,216

CLASS 335

176 4,074,218

CLASS 337

186 4,074,219
276 4,074,220

CLASS 338

21 4,074,221
212 4,074,222

CLASS 339

94 R 4,073,559
99 R 4,073,560
112 R 4,073,561
117 P 4,073,562
128 4,073,563
157 C 4,073,564
223 S 4,073,565

CLASS 340

1 R 4,074,223
8 PC 4,074,224
52 B 4,074,226
58 4,074,227
146.1 AG 4,074,229
146.1 AQ 4,074,228
146.1 BE 4,074,230
146.3 AG 4,074,231
147 LP 4,074,233
147 R 4,074,232
171 R 4,074,234
189 M 4,074,241
213.1 4,074,242
237 R 4,074,225
4,074,243
244 R 4,074,244
248 B 4,074,245
274 R 4,074,246
276 4,074,247
4,074,248
280 4,074,249
304 4,074,250
309.4 4,074,251
321 4,074,252
324 AD 4,074,254
324 M 4,074,253
336 4,074,255
4,074,256
347 AD 4,074,259
347 CC 4,074,260
347 NT 4,074,257
347 P 4,074,258
365 R 4,074,261
365 S 4,074,262

CLASS 343

6.8 LC 4,074,263
17.1 R 4,074,264
18 E 4,074,265
100 SA 4,074,266
106 R 4,074,267
4,074,268
225 4,074,269
700 MS 4,074,270
882 4,074,271

CLASS 346

19 4,074,275
33 A 4,074,272
34 4,074,273
4,074,274
74.1 4,074,276
75 4,074,277
4,074,278
4,074,279
76 R 4,074,280
110 R 4,074,281
135 4,074,282
139 C 4,074,283
140 R 4,074,284

CLASS 350

3.71 4,073,566
6.5 4,073,567
103 4,073,568
137 4,073,569
174 4,073,572
187 4,073,573
189 4,073,574
214 4,073,575
273 4,073,576
337 4,073,571
357 4,073,570

CLASS 351

160 4,073,577
167 4,073,578
169 4,073,579

CLASS 352

91 C 4,073,580
129 4,073,581
141 4,073,582

CLASS 354

15 4,074,285
21 4,074,286
23 D 4,074,289
31 4,074,287
33 4,074,288
34 4,074,290
51 4,074,291
53 4,074,292
106 4,074,294
145 4,074,295
187 4,074,296
285 4,074,297
299 4,074,298

CLASS 355

3 CH 4,073,587
3 P 4,073,583
8 4,073,584
14 4,073,585
20 4,073,586
30 4,074,217
41 4,073,588
50 4,073,589

CLASS 356

209 4,073,590

CLASS 357

17 4,074,299
23 4,074,300
4,074,301
24 4,074,302
33 4,074,303
34 4,074,293
59 4,074,304
67 4,074,305

CLASS 358

1 4,074,306
8 4,074,307
31 4,074,321
38 4,074,308
82 4,074,309
84 4,074,310
118 4,074,311
128 4,074,312
4,074,313
4,074,314
142 4,074,315
181 4,074,316
4,074,317
230 4,074,318
4,074,319
4,074,320
237 4,074,322
243 4,074,323
296 4,074,324

CLASS 360

39 4,074,325
55 4,074,326
74 4,074,327
77 4,074,328
85 4,074,329
102 4,074,330
104 4,074,331
137 4,074,332

CLASS 361

13 4,074,333
79 4,074,334
87 4,074,335
88 4,074,336
124 4,074,337
129 4,074,338
239 4,074,339
321 4,074,340
331 4,074,341
411 4,074,342

CLASS 362

13 4,074,121
200 4,074,122
217 4,074,124
271 4,074,125
297 4,074,126
319 4,074,123

CLASS 363

14 4,074,343
44 4,074,344
48 4,074,345
50 4,074,346
158 4,074,347
160 4,074,348

CLASS 364

107 4,074,349
4,074,350
200 4,074,351
4,074,352
4,074,353
4,074,354
4,074,355
465 4,074,356
494 4,074,357
514 4,074,358
521 4,074,359
551 4,074,360
712 4,074,118
713 4,074,361
807 4,074,119
900 4,074,235

CLASS 365

104 4,074,238
176 4,074,239
192 4,074,240
200 4,074,236
230 4,074,237

CLASS 366

82 4,074,362
138 4,074,363

CLASS 403

24 4,073,591

CLASS 404

89 4,073,592
114 4,073,593

CLASS 415

1 4,073,594
143 4,073,595
180 4,073,596
201 4,073,597

CLASS 416

5 4,073,598
97 R 4,073,599
140 4,073,600
242 4,073,601

CLASS 417

185 4,073,602
222 4,073,603
226 4,073,604
283 4,073,605
424 4,073,606

CLASS 418

86 4,073,607
241 4,073,608

CLASS 423

140 4,073,860
219 4,073,861
220 4,073,862
222 4,073,863
242 4,073,864
339 4,073,865
405 4,073,866
429 4,073,867
443 4,073,868
447.1 4,073,869
447.6 4,073,870
481 4,073,871
496 4,073,872
499 4,073,873
500 4,073,874
504 4,073,875
508 4,073,876
616 4,073,877
633 4,073,878

CLASS 424

5 4,073,879
66 4,073,880
70 4,073,881
84 4,073,882
94 4,073,883
4,073,884
101 4,073,885
147 4,073,887
149 4,073,888
164 4,073,889
177 4,073,890
4,073,891
4,073,892
200 4,073,893
4,073,894
205 4,073,895
230 4,073,896
233 4,073,897
238 4,073,898
243 4,073,899
245 4,073,900
246 4,073,901
4,073,902
4,073,903
248.56 4,073,905
248.58 4,073,904
251 4,073,906
253 4,073,907
4,073,908
258 4,073,909
266 4,073,910
267 4,073,911
4,073,912
4,073,913
4,073,914
4,073,915
4,073,916
270 4,073,917
4,073,918
4,073,919
271 4,073,920
273 R 4,073,921
4,073,922
4,073,923
4,073,924
4,073,925
4,073,926
4,073,927
4,073,928
4,073,929
277 4,073,930
279 4,073,932
298 4,073,931
299 4,073,933
305 4,073,934
308 4,073,935
4,073,936
312 4,073,937
317 4,073,938
320 4,073,939
324 4,073,940
4,073,941
330 4,073,942
358 4,073,943

CLASS 425

146 4,073,944
442 4,073,609
577 4,073,610

CLASS 426

2 4,073,945
4,073,946
13 4,073,947
44 4,073,948
106 4,073,949
128 4,073,950
237 4,073,951
242 4,073,952
297 4,073,953
330.3 4,073,954
422 4,073,955
470 4,073,956
535 4,073,957
559 4,073,958
578 4,073,959
580 4,073,960
589 4,073,961
646 4,073,962
658 4,073,963

CLASS 427

10 4,073,964
22 4,073,965
26 4,073,966
44 4,073,967
54 4,073,968
75 4,073,969
96 4,073,970
103 4,073,971
136 4,073,972
142 4,073,973
163 4,073,974
170 4,073,975
181 4,073,976
216 4,073,977
235 4,073,978
244 4,073,979
259 4,073,981
270 4,073,982
421 4,073,983
444 4,073,984

CLASS 428

35 4,073,985
38 4,073,986
81 4,073,987
91 4,073,988
131 4,073,989
138 4,073,990
4,073,991
207 4,073,992
261 4,073,993
265 4,073,994
4,073,995
274 4,073,996
285 4,073,997
310 4,073,998
311 4,073,999
323 4,074,000
329 4,074,001
331 4,074,002
341 4,074,003
355 4,074,004
378 4,074,005
379 4,074,006
404 4,073,980
411 4,074,007
418 4,074,008
421 4,074,009
422 4,074,010
4,074,011
425 4,074,012
457 4,074,013
506 4,074,014
526 4,074,015
626 4,074,016

CLASS 429

1 4,074,017
10 4,074,027
21 4,074,018
34 4,074,020
50 4,074,019
51 4,074,021
54 4,074,022
56 4,074,023
86 4,074,024
91 4,074,025
104 4,074,026
105 4,074,028
198 4,074,029
223 4,074,030

CLASS 431

45 4,073,611
126 4,073,612
202 4,073,613

CLASS 526

44 4,074,032
47 4,074,033
49 4,074,031
56 4,074,034
185 4,074,035
238 4,074,036
280 4,074,037
4,074,038
303 4,074,039
352 4,074,040

CLASS 528

488 4,074,041

CLASS 536

1 4,074,042
52 4,074,043

CLASS 542

402 4,074,044
426 4,074,045
439 4,074,046

CLASS 544

30 4,074,047
49 4,074,048
82 4,074,049
92 4,074,050
140 4,074,051
221 4,074,052

CLASS 548

305 4,074,053
335 4,074,054
347 4,074,055

CLASS 560

51 4,074,056
55 4,074,057
105 4,074,058
121 4,074,063
135 4,074,059
149 4,074,060
193 4,074,061
217 4,074,062

CLASSIFICATION OF DESIGNS

D2—	310	247,201
	330	247,202
D6—	91	247,203
	137	247,204
	138	247,205
	184	247,206
		247,207
	191	247,208
	201	247,209
D7—	22	247,210
	131	247,211
	179	247,212
D8—	18	247,213
	51	247,214
	88	247,215
	356	247,216
		247,217
	359	247,218
	371	247,219
		247,220
D9—	168	247,221
	192	247,222
	193	247,223
D10—	38	247,224
	44	247,225
	46	247,226
		247,227
D11—	1	247,228
	135	247,229
	137	247,230
	160	247,231
D12—	54	247,232
	143	247,233
	155	247,234
D14—	12	247,235
	33	247,236
	35	247,237
	40	247,238
		247,239
	72	247,240
D16—	04	247,241
	21	247,242
	32	247,243
	44	247,244
	83	247,245
D19—	45	247,246
D22—	25	247,247
D23—	1	247,248
	150	247,249
	153	247,250
D24—	17	247,251
	52	247,252
D25—	16	247,253
	36	247,254
D27—	3	247,255
D34—	5 GC	247,257
	5 ST	247,256
	15 B	247,258
		247,259
	40	247,260
D64—	10	247,261
D87—	3 F	247,262
	8.3	247,263
D96—	9	247,264
	12 A	247,265

CLASSIFICATION OF PLANTS

P.—	68	4,215
	69	4,213
		4,214

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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4 : 4,073,215
4,073,328
4,073,395
4,073,423
4,073,479
4,073,657
4,074,017
4,074,158
4,074,257
4,074,361
5 : 4,073,144
6 : 4,073,017
4,073,029
4,073,037
4,073,038
4,073,082
4,073,083
4,073,088
4,073,103
4,073,132
4,073,138
4,073,159
4,073,166
4,073,172
4,073,175
4,073,192
4,073,193
4,073,196
4,073,205
4,073,225
4,073,257
4,073,259
4,073,267
4,073,278
4,073,286
4,073,323
4,073,327
4,073,340
4,073,349
4,073,351
4,073,353
4,073,356
4,073,367
4,073,369
4,073,394
4,073,401
4,073,403
4,073,411
4,073,412
4,073,427
4,073,477
4,073,482
4,073,490
4,073,492
4,073,495
4,073,506
4,073,510
4,073,512
4,073,521
4,073,527
4,073,552
4,073,555
4,073,559
4,073,560
4,073,562
4,073,571
4,073,589
4,073,596
4,073,620
4,073,633
4,073,644
4,073,653
4,073,681
4,073,685
4,073,699
4,073,747
4,073,778
4,073,830
4,073,832
4,073,834
4,073,879
4,073,897
4,073,955
4,073,982
4,073,985
4,074,018
4,074,031
4,074,039
4,074,067
4,074,097
4,074,134
4,074,142
4,074,146
4,074,170
4,074,178
4,074,196
4,074,212
4,074,230
4,074,254
4,074,264
4,074,265
4,074,267
4,074,268
4,074,270
4,074,272
4,074,275
4,074,284
4,074,311
4,074,324
4,074,347
4,074,351
4,074,352
4,074,359
8 : 4,073,072
4,073,212
4,073,283
4,073,317
4,073,382
4,073,392
4,074,078
4,074,129
4,074,281
4,074,330
9 : Re.29,537
4,073,064
4,073,133
4,073,137
4,073,162
4,073,312
4,073,386
4,073,391
4,073,398
4,073,461
4,073,463
4,073,499
4,073,515
4,073,579
4,073,639
4,073,664
4,073,667
4,073,671
4,073,684
4,073,780
4,073,783
4,074,044
4,074,055
4,074,122
4,074,130
4,074,148
4,074,162
4,074,250
4,074,269
4,074,340
4,074,345
4,074,356
10 : 4,073,298
4,073,802
4,073,956
11 : 4,074,227
12 : 4,073,074
4,073,100
4,073,174
4,073,181
4,073,227
4,073,285
4,073,290
4,073,478
4,073,503
4,073,529
4,073,578
4,073,606
4,073,951
4,074,107
4,074,188
13 : 4,073,018
4,073,040
4,073,081
4,073,631
4,073,887
4,073,978
4,074,005
16 : 4,073,216
4,074,298
17 : 4,073,015
4,073,061
4,073,075
4,073,110
4,073,117
4,073,127
4,073,141
4,073,219
4,073,221
4,073,226
4,073,228
4,073,231
4,073,243
4,073,282
4,073,296
4,073,384
4,073,389
4,073,419
4,073,433
4,073,454
4,073,485
4,073,486
4,073,496
4,073,504
4,073,524
4,073,539
4,073,540
4,073,556
4,073,563
4,073,565
4,073,591
4,073,593
4,073,621
4,073,624
4,073,634
4,073,672
4,073,673
4,073,763
4,073,772
4,073,794
4,073,823
4,073,852
4,073,894
4,073,907
4,073,948
4,073,979
4,073,993
4,074,003
4,074,071
4,074,079
4,074,141
4,074,157
4,074,179
4,074,183
4,074,186
4,074,214
4,074,233
4,074,243
4,074,323
18 : 4,073,209
4,073,220
4,073,239
4,073,373
4,073,399
4,073,418
4,073,420
4,073,538
4,073,610
4,073,611
4,073,722
4,073,768
4,073,774
4,073,788
4,073,966
4,074,220
4,074,221
4,074,223
4,074,321
4,074,350
19 : 4,073,076
4,073,346
4,073,501
4,073,592
4,073,937
4,073,947
4,073,959
4,073,983
20 : 4,073,377
4,073,523
4,073,532
4,073,712
4,073,928
4,074,252
21 : 4,073,308
22 : 4,073,060
4,073,154
4,073,303
4,073,388
4,073,453
4,073,508
4,073,718
4,073,759
4,073,760
4,074,058
23 : 4,073,097
4,073,339
24 : 4,073,070
4,073,322
4,073,404
4,073,413
4,073,564
4,073,590
4,073,665
4,073,691
4,073,694
4,073,884
4,073,885
4,073,929
4,073,939
4,074,099
4,074,263
25 : 4,073,019
4,073,050
4,073,059
4,073,069
4,073,071
4,073,085
4,073,122
4,073,123
4,073,179
4,073,256
4,073,381
4,073,497
4,073,553
4,073,561

4,073,695
4,073,730
4,073,843
4,073,973
4,073,994
4,073,995
4,074,065
4,074,083
4,074,088
4,074,166
4,074,184
4,074,187
4,074,201
4,074,208
4,074,241
4,074,247
4,074,285
4,074,288
4,074,295
4,074,310
4,074,353
26 : 4,073,051
4,073,105
4,073,106
4,073,114
4,073,145
4,073,236
4,073,238
4,073,272
4,073,288
4,073,307
4,073,311
4,073,370
4,073,430
4,073,457
4,073,459
4,073,465
4,073,493
4,073,502
4,073,517
4,073,601
4,073,602
4,073,784
4,073,785
4,073,803
4,073,805
4,073,808
4,073,842
4,073,855
4,074,014
4,074,021
4,074,049
4,074,117
4,074,125
4,074,273
27 : Re.29,536
4,073,091
4,073,109
4,073,119
4,073,120
4,073,171
4,073,230
4,073,279
4,073,287
4,073,315
4,073,533
4,073,848
4,073,950
4,073,952
4,073,999
4,074,004
4,074,012
4,074,043
4,074,204
4,074,245
28 : 4,073,016
4,073,130
29 : 4,073,032
4,073,167
4,073,273
4,073,289
4,073,397
4,073,416

4,073,581
4,073,686
4,073,690
4,073,767
4,073,829
4,073,962
4,074,234
4,074,251
30 : 4,073,240
31 : 4,073,182
4,073,336
4,073,345
4,073,437
4,073,531
32 : 4,073,659
4,074,094
33 : 4,073,371
4,073,840
34 : 4,073,036
4,073,143
4,073,207
4,073,208
4,073,229
4,073,235
4,073,241
4,073,263
4,073,268
4,073,291
4,073,292
4,073,376
4,073,385
4,073,447
4,073,467
4,073,522
4,073,576
4,073,632
4,073,650
4,073,660
4,073,666
4,073,675
4,073,692
4,073,716
4,073,726
4,073,732
4,073,735
4,073,736
4,073,737
4,073,743
4,073,750
4,073,751
4,073,766
4,073,771
4,073,789
4,073,791
4,073,795
4,073,811
4,073,821
4,073,822
4,073,853
4,073,856
4,073,861
4,073,868
4,073,869
4,073,876
4,073,880
4,073,888
4,073,911
4,073,912
4,073,963
4,073,974
4,073,981
4,074,019
4,074,027
4,074,035
4,074,036
4,074,046
4,074,048
4,074,056
4,074,059
4,074,072
4,074,113
4,074,124
4,074,139

4,074,205
4,074,209
4,074,211
4,074,225
4,074,239
4,074,253
4,074,255
4,074,305
4,074,307
4,074,308
4,074,313
4,074,318
4,074,319
4,074,320
4,074,332
4,074,358
35 : 4,073,468
4,073,525
4,073,608
36 : 4,073,014
4,073,021
4,073,049
4,073,056
4,073,068
4,073,087
4,073,096
4,073,102
4,073,142
4,073,165
4,073,184
4,073,280
4,073,295
4,073,314
4,073,325
4,073,329
4,073,337
4,073,365
4,073,368
4,073,380
4,073,414
4,073,426
4,073,449
4,073,455
4,073,460
4,073,464
4,073,530
4,073,558
4,073,569
4,073,583
4,073,629
4,073,640
4,073,648
4,073,649
4,073,654
4,073,662
4,073,693
4,073,698
4,073,711
4,073,740
4,073,741
4,073,761
4,073,765
4,073,773
4,073,776
4,073,814
4,073,826
4,073,865
4,073,886
4,073,965
4,073,970
4,074,000
4,074,006
4,074,028
4,074,029
4,074,030
4,074,033
4,074,042
4,074,066
4,074,095
4,074,096
4,074,126
4,074,132

4,074,137
4,074,150
4,074,151
4,074,153
4,074,176
4,074,182
4,074,237
4,074,240
4,074,246
4,074,248
4,074,249
4,074,260
4,074,276
4,074,277
4,074,282
4,074,293
4,074,297
4,074,322
4,074,327
4,074,338
4,074,339
4,074,346
37 : 4,073,023
4,073,026
4,073,043
4,073,124
4,073,246
4,073,313
4,073,378
4,074,087
39 : Re.29,538
4,073,020
4,073,024
4,073,047
4,073,066
4,073,077
4,073,090
4,073,094
4,073,176
4,073,194
4,073,206
4,073,255
4,073,409
4,073,422
4,073,441
4,073,458
4,073,462
4,073,514
4,073,518
4,073,550
4,073,551
4,073,554
4,073,568
4,073,597
4,073,609
4,073,637
4,073,655
4,073,706
4,073,713
4,073,748
4,073,752
4,073,770
4,073,820
4,073,833
4,073,839
4,073,858
4,073,899
4,073,904
4,073,944
4,073,946
4,073,949
4,073,980
4,073,989
4,073,992
4,073,996
4,073,997
4,074,023
4,074,037
4,074,038
4,074,076
4,074,103
4,074,104

4,074,108
40 : 4,073,344
4,073,402
4,073,511
4,073,630
4,073,719
4,073,720
4,073,734
4,074,145
41 : 4,073,025
4,073,041
4,073,042
4,073,078
4,073,079
4,073,169
4,073,186
4,073,187
4,073,189
4,073,261
4,073,723
4,073,804
42 : 4,073,048
4,073,052
4,073,053
4,073,185
4,073,214
4,073,222
4,073,304
4,073,306
4,073,334
4,073,424
4,073,470
4,073,472
4,073,491
4,073,544
4,073,599
4,073,600
4,073,603
4,073,607
4,073,638
4,073,668
4,073,683
4,073,701
4,073,703
4,073,819
4,073,824
4,073,825
4,073,828
4,073,845
4,073,849
4,073,896
4,073,921
4,073,924
4,073,926
4,073,927
4,073,975
4,073,976
4,073,986
4,073,991
4,074,010
4,074,102
4,074,175
4,074,197
4,074,218
4,074,242
4,074,244
4,074,301
4,074,344
4,074,357
44 : 4,073,046
4,073,617
4,073,700
45 : 4,073,098
4,073,321
4,073,417
4,073,494

4,074,192
47 : 4,073,034
4,073,111
4,073,647
4,073,680
4,073,745
4,073,777
4,074,061
48 : Re.29,539
4,073,108
4,073,121
4,073,245
4,073,341
4,073,342
4,073,343
4,073,362
4,073,363
4,073,466
4,073,476
4,073,548
4,073,704
4,073,836
4,073,873
4,073,969
4,074,110
4,074,147
4,074,219
4,074,355
49 : 4,073,242
4,073,294
4,073,354
4,074,120
51 : 4,073,249
4,073,320
4,073,387
4,073,393
4,073,445
4,073,678
4,073,796
4,074,116
4,074,128
4,074,342
53 : 4,073,199
4,073,211
4,073,258
4,073,305
4,073,309
4,073,364
4,073,366
4,073,438
4,073,440
4,073,475
4,073,537
4,073,572
4,073,626
4,073,708
4,073,753
4,074,085
4,074,195
54 : 4,073,507
4,073,930
55 : 4,073,062
4,073,092
4,073,200
4,073,223
4,073,318
4,073,347
4,073,375
4,073,410
4,073,557
4,073,605
4,073,798
4,073,967
4,074,009
4,074,063
4,074,091
4,074,100
4,074,112
4,074,156
4,074,177
4,074,194
56 : 4,073,352

DESIGN PATENTS

4 : 247,219
247,220
247,257
6 : 247,216
247,221
247,225
247,226
247,227
247,231

9 : 247,207
247,242
12 : 247,215
247,250
17 : 247,212
18 : 247,202

247,234
247,244
247,262
24 : 247,201
25 : 247,217
247,228
247,251
26 : 247,213
247,232

247,210
247,236
247,237
33 : 247,235
34 : 247,264
36 : 247,222
247,239

247,265
27 : 247,209
247,229
247,230

247,241
247,243
247,245
247,252
247,253
37 : 247,223
40 : 247,218
44 : 247,214

45 : 247,255
48 : 247,203
247,204
247,260
49 : 247,211
53 : 247,208
247,256
55 : 247,206

PLANT PATENTS

25 : 4,215

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